NAVAL FACILITIES ENGINEERING COMMAND

GUIDE PERFORMANCE WORK STATEMENT (GPWS)

FOR

HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION;

AND COMPRESSED AIR SYSTEMS; OPERATION,

MAINTENANCE, AND REPAIR

JULY 1991

PREPARED BY:

SOUTHERN DIVISION, NAVAL FACILITIES ENGINEERING COMMAND

CHARLESTON, SC

THIS GUIDE PERFORMANCE WORK STATEMENT HAS BEEN REVIEWED AND APPROVED BY:

_____ _____

ASSISTANT COMMANDER FOR DATE
PUBLIC WORKS CENTERS AND DEPARTMENTS
NAVAL FACILITIES ENGINEERING COMMAND

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GUIDE PERFORMANCE WORK STATEMENT (GPWS) FOR
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USER FEEDBACK/COMMENT SHEET
GUIDE PERFORMANCE WORK STATEMENT FOR
HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION;
AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

This User Feedback/Comment Sheet has been provided to allow the User of the Guide Performance Work Statement (GPWS) for Heating, Ventilating, Air Conditioning; Refrigeration; and Compressed Air Systems; Operation, Maintenance, and Repair to provide comments and recommended changes to SOUTHNAVFACENGCOM.

The success of SOUTHNAVFACENGCOM'S continuing GPWS revision and improvement efforts will depend heavily upon input provided by users at the activity level and at the NAVFACENGCOM Engineering Field Divisions. Be assured that any comments received will be reviewed in detail and incorporated into the next edition of the GPWS, if appropriate. Such comments should be provided (as a minimum) immediately after the initial receipt/use, and again approximately six months into the initial contract term. Comments should be as specific and detailed as possible, and should include:

- Suggested changes in format.
- Comments on the effort required to tailor the GPWS.
- Alternate paragraphs and approaches to describing the services to be provided.
- Adequacy of the technical specification.
- Alternate procedures and formats for displaying historical data, Schedule of Deductions, Contract Line Items, etc.
- Adequacy of the User's Guide and Quality Assurance Guide.
- Effectiveness and practicality of the suggested quality assurance plans.

COMMENTS
(Attach additional sheets, if required)

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USER:_____ _____
(Activity Name) (Activity Address)

POINT OF CONTACT:_____ _____
(Name/Code) (Telephone Number)

Mail User Feedback/Comment Sheets to:
Commanding Officer
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USER’S GUIDE

FOR

HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION; AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

USER'S GUIDE
GUIDE PERFORMANCE WORK STATEMENT FOR
HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION;
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USER'S GUIDE
GUIDE PERFORMANCE WORK STATEMENT FOR
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I. INTRODUCTION

A. Purpose. This NAVFAC Guide Performance Work Statement (GPWS) has been written to provide assistance in preparing facilities support contracts to procure operation, maintenance, and repair services for heating, ventilating, and air conditioning (HVAC), refrigeration, and compressed air systems. Contracts for such services may be a continuing contracting effort or conversion of services from in-house to contract performance under the Commercial Activities (CA) program. This NAVFAC GPWS may be used in either application. This GPWS Package consists of a User's Guide, guide contract sections B, C, and J in the Uniform Contract Format, and a Quality Assurance (QA) Guide.

1. NAVFAC manual MO-327, *Facility Support Contract Quality Management Manual*, provides extensive information on the preparation of NAVFAC facilities support contracts, from guidance on acquisition planning through the entire PWS and surveillance program development process. This User's Guide is designed to supplement and to be used in conjunction with the NAVFAC MO-327 in developing a PWS for HVAC services. It provides specific guidance on developing and tailoring the GPWS, special items which must be considered if the specification is being written in conjunction with a CA program study, and general guidance on required pre-award actions. Additional guidance on implementing CA program requirements can be found in the Supplement to OMB Circular A-76 and in OPNAVINST 4860.7B.

2. Sections B, C, and J provide suggested formats for displaying contract line (bid) items, technical specifications which the user may tailor to site specific needs, and attachments which provide supplemental information, historical data, etc.

3. The QA guide is designed to provide the framework for development of a comprehensive contract surveillance program. The user should modify and expand upon the sample QA plans provided as the GPWS is tailored.

4. The purpose of this GPWS is to provide guidance in preparing facilities support contracts to procure HVAC services, not to provide NAVFAC procurement guidance or policy. Such guidance and policy may be found in the NAVFAC P-68, *Contracting Manual*.

B. Function Definition. For purposes of this GPWS, the function is defined to include all labor, transportation, equipment, materials, supplies, management, coordination, and supervision required to operate, maintain, and repair HVAC, refrigeration, and compressed air systems and equipment. This GPWS contains those recurring HVAC, refrigeration, and compressed air systems related maintenance, repair, and other services which the typical activity would need to accomplish either with in-house forces or by contract, and for which the quantity and scope of work can be clearly defined.

1. Under the CA program, air conditioning and refrigeration plants (CA functional code S729) is defined by OPNAVINST 4860.7B as including the operation, maintenance, and repair of air conditioning and refrigeration plants over five tons in capacity. Although this GPWS does include systems smaller

than five tons, only minor tailoring would be required for activities conducting a CA program study to remove them.

2. Maintenance and repair of heating systems, other than those included as part of reverse cycle cooling/heating systems and systems containing electrical resistance strip heating elements, are not included in the GPWS. Heating systems services may be found in the NAVFAC GPWSs for Buildings and Structures Maintenance (systems under 750,000 Btu capacity) and Central Heating Plant and Steam Distribution Systems (systems over 750,000 Btu in capacity). These GPWSs are available from each of the NAVFACENGCOM Engineering Field Divisions (EFDs). Since most NAVFAC GPWSs are written in the same format, the technical requirements of Sections C and J of this GPWS may be easily combined with those of other GPWSs to produce whatever combination of services the user may require.

3. Maintenance and repair services are limited in the GPWS to a maximum cost (per repair) of $2,000, since Davis-Bacon wage provisions may be included in non-CA program contracts only with prior EFD approval. Paragraph III.E of this User's Guide provides a complete discussion of this limitation, and explains what changes the user would be required to make the GPWS to include work costing more than $2,000.

C. Responsibilities

1. Experience has shown that the best method of developing a facilities support contract specification is to involve a number of activity personnel, each having a portion of the knowledge and experience required to put the entire package together. A team of experienced activity personnel should be formed and a team leader appointed. The team leader will be responsible for development and tracking of procurement milestones, ensuring that each team member understands what specific tasks he/she is responsible for, when each task must be completed, etc. At least one member of the team must be intimately familiar with each of the following areas:

a. Must be familiar with and understand the applicable GPWS(s) and QA Guide(s).

b. Must have a working knowledge of basic contracting procedures.

c. Must have first hand knowledge of the services, and/or equipment/system operations, repairs, and maintenance to be provided by contract.

d. Must be able to identify local needs/requirements that are different from the GPWS and apply specifically to the activity.

2. The following activity personnel are suggested as members of the specification development team.

a. Specification Writer. The HVAC services specification is most properly prepared by an engineer or engineering technician at the activity who has had at least some experience in writing facilities support contracts. The use of a planner and estimator (P&E) is also appropriate if one is experienced with writing contract specifications. The writer, regardless of who the person is, should have attended the Civil Engineer Corps Officers School (CECOS) course, Facilities Support Contracts for Functional Managers. Assistance and

guidance may be requested from the geographical NAVFACENGCOM Engineering Field Division (EFD). The EFD may offer courses on PWS development, quality assurance, and other related subjects that may be of benefit to the specification writer.

b. Functional Manager/Customer. The functional manager is the technical representative of the team who is most familiar with the function to be contracted. Early in the tailoring process the Utilities Division Director or other HVAC functional expert must determine the total scope of the services required, develop detailed inventories of the equipment and systems to be maintained, collect historical information on work quantities, and identify the specific needs of the activity which may differ from this GPWS. Customer representatives should also be contacted, if appropriate, since they should be able to identify any specific HVAC, refrigeration, or compressed air systems needs or concerns.

c. Facilities Support Contract Manager. If there is an existing HVAC contract, the Facilities Support Contract Manager (FSCM) or Quality Assurance Evaluator (QAE) should be able to provide lessons learned and other information pertinent to the new specification. The FSCM/QAE will also be responsible for preparing required Quality Assurance Plans (see Quality Assurance Guide) and for ensuring that services are specified in such a way as to be inspectable.

d. Contract Specialist. The Contract Specialist provides overall contractual guidance in the preparation of the specification. This person will work with the writer in the preparation of sections B, C, and J, and will prepare the majority of the clauses in sections E, F, G, H, I, K, L, and M. Additionally, there are many pre-award and post-award contract actions to be initiated by the Contract Specialist.

e. CA Program Manager. If the specification is being prepared under the CA program, the CA Program Manager provides overall guidance on the CA program, and will ensure that the specification is developed in conjunction with required most efficient organization and management studies.

3. The tailored specification should be reviewed by customer and functional manager representatives, the Engineering Division Director, and the Facilities Management Engineering Director. Consult appropriate EFD instructions to determine if EFD review/approval is required prior to solicitation.

II. GPWS DEVELOPMENT AND USER CONSIDERATIONS. This section of the User's Guide discusses certain assumptions which were made and special items that were considered during the development of the HVAC; Refrigeration; and Compressed Air Systems; Operation, Maintenance, and Repair GPWS, and provides general information and considerations that the user should be aware of during the tailoring process.

A. Development of the GPWS. In developing this GPWS a functional analysis, as described in NAVFAC MO-327, was performed to identify each of the major subfunctions for HVAC, refrigeration, and compressed air systems, operation, maintenance, and repair. Each of these subfunctions was carefully reviewed to determine which could realistically be contracted for. Once a final list was developed, each subfunction was further subdivided to develop basic work requirements and standards of performance. Once all of the basic work

requirements were identified for each subfunction, a Performance Requirements Summary Table was developed and the requirements were put into narrative form.

B. GPWS User Considerations. The clauses and provisions of this GPWS are arranged in the uniform contract format as required by the Federal Acquisition Regulation (FAR). The sections to which they are assigned shall not be changed.

1. This GPWS contains sections B, C, and J only. These sections contain information and clauses peculiar to the technical services required, while Sections D, E, F, G, H, I, K, L, and M contain contract clauses and provisions more closely related to administrative and contractual requirements. Since the latter group will generally be the same in the majority of NAVFAC contracts, their inclusion in each GPWS would be unnecessary duplication. These clauses are included in Uniform Contract Format Guide (UCFG) published by NAVFAC. The UCFG should be available at each of the geographical EFDs and at NAVFAC contracting offices, and should be made available to specification writers as required.

2. FAR clauses and provisions may be added or deleted as required by the FAR for specific functions, dollar limitations, bonding, small businesses, etc. They may not be altered unless specifically authorized by the FAR. Most of the clauses in sections I and L, other than those requiring tailoring (i.e. blanks to be completed), may be included by reference. All other FAR clauses and provisions shall be included in full text. Procurement offices shall make available to bidders the full text of all clauses incorporated by reference upon request.

3. The "SCHEDULE OF DEDUCTIONS", "ESTIMATING THE PRICE OF NONPERFORMED OR UNSATISFACTORY WORK", and "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES" clauses are NAVFAC, not FAR clauses, and shall not be altered without NAVFAC approval. All other non-FAR clauses and provisions in the UCFG should be used substantially as shown or deleted if not applicable to the solicitation. Extensive deliverable performance requirements should not be added to these clauses, but should be included in Section C.

4. Technical Specification

a. Section C, which describes the services to be provided, should be a performance specification to the maximum extent possible. That is, over defining the Contractor's responsibilities in terms of methods or procedures should be avoided in writing the technical specifications since we hope to purchase not only the Contractor's labor, but also his/her expertise in the services to be provided and management of those services. A performance oriented specification should minimize the use of words describing "how to", but should describe work outputs required as explicitly as possible while leaving the Contractor latitude to manage his/her own work force and choose his/her own methods for accomplishing the work.

b. On the other hand, the specification must provide enough information to clearly and precisely define the magnitude (number of services we want to buy) and quality of each of the services to be provided, as well as the scope or limit of each. This is accomplished in the GPWS by specifying, in addition to the desired outputs, schedules of accomplishment and/or specific time limitations in which all services must be completed; listing mandatory operating procedures or steps that the Contractor must follow for some services; and providing historical data on the magnitude of services provided under

previous contracts or by in-house forces. Such information will only slightly restrict the Contractor's latitude in managing his/her workforce, but will help ensure all bidders clearly visualize the magnitude of effort which will be required to provide the clearly defined scope of work. Typically this will result in more accurate/realistic Contractor bids, make payment deductions for unsatisfactorily performed or non-performed work easier to calculate, and reduce the number of contract administration problems.

5. As you use this GPWS you will find in many instances there will be a "NOTE TO THE SPECIFICATION WRITER". These notes provide the user with additional information and/or advise the user to select the appropriate clause, insert additional information, or delete the clause in its entirety. There are also many areas within the text of the GPWS where notes indicate that additional information must be provided; e.g. start times, dates, quantities, etc. These notes will always be enclosed by the symbol "!". All that is required is to replace the note with the required information.

III. TAILORING THE GPWS. The NAVFAC GPWS for HVAC; Refrigeration; and Compressed Air Systems; Operation, Maintenance, and Repair services is not intended to fit the requirements of a specific activity, but rather, is to serve as a model to be tailored by activities in preparing their specific PWS. The first step in tailoring a GPWS to a specific case is for the user to become intimately familiar with the GPWS and its User's Guide. The user must know what is, and is not, included in the GPWS and what was intended before any required modifications may be assessed. The PWS is the instrument that lays out the functional and technical requirements and ultimately becomes part of a contract. The User's Guide provides the user with information concerning the GPWS and provides instructions on tailoring. Users should not assume that the GPWS can be "plugged" into their application with little or no effort. A detailed analysis of the activity's requirements will be required.

A. Getting Started

1. The first step in tailoring this GPWS to a specific user activity must be to determine one of the following:

a. Are the requirements currently contracted, and will this be a continuation of the contracted services, or a consolidation of several contracts? If this is the case, the GPWS may be tailored to accomplish any desired scope of work and level of performance.

b. Are the requirements to be included in the PWS subject to a CA cost comparison study under OMB Circular A-76? If this is the case, it is mandatory that the scope of work and level of performance specified be equivalent to the level of effort that can be achieved by the Most Efficient Organization (MEO) if the function is retained in-house. Additional information on tailoring of the GPWS for a CA program study is included in paragraph IV of this User's Guide.

2. The next step should be a thorough review of Chapters 2 and 3 of NAVFAC MO-327. These two chapters outline how to perform a job analysis to determine the specific subfunctions to be contracted (including specific work requirements and standards of performance) and how to use the job analysis information and data collected to actually write the PWS. As the job analysis is being performed, the user should compare unique activity requirements with GPWS requirements to determine if any major changes are required, or if some of

the questions being identified in the job analysis have already been answered in the GPWS. If major changes are required, the user will need to re-write the affected GPWS section. A thorough job analysis will make the actual tailoring of the GPWS and re-writing of paragraphs relatively easy since all required data will be readily available and the subfunctions to be contracted will be well defined.

B. Contract Line Item Requirements (Section B). A combination firm fixed-price and indefinite quantity contract is used in this GPWS because it is by far the most common type of contract for HVAC services. However, other contract types may be used based on extenuating circumstances. The user should solicit input from the contract specialist or the EFD Contract Department when deciding on the most appropriate contract type. All of the contract requirements in the PWS must be included in either the firm fixed-price or fixed unit price (indefinite quantity) contract line items in Section B. The contract line items shown in Section B of the GPWS are intended to encompass all of the services (contract requirements) to be provided in the technical specifications. Of course they must be tailored to account for contract requirements added or deleted during the job analysis process, and the projected start date of contract performance.

1. Fixed-Price Requirements. Fixed-price contract line (bid) items are bid and payment is made for the total performance of a given contract requirement over a given period of time (usually one month). These contract requirements are either fixed in scope (time, location, frequency, quantity, etc. are known or can be accurately estimated) or adequate historical data is available to make a biddable estimate. Because the scope of work is known, the Contractor agrees to perform a given requirement for a total price, and in essence there is one work order. The Contractor performs the work as scheduled and invoices are submitted for the services provided.

a. Examples of firm fixed-price contract requirements in this GPWS include:

- Equipment operation, including operator maintenance
- Performance of emergency, urgent, and routine service work on equipment
- Performance of preventive maintenance inspection and service
- Performance of system start-ups and shut-downs
- Treatment of cooling tower and chill water systems to prevent scaling, corrosion, and biological growths

(1) Some of these contract requirements, such as service work, are limited in scope to specified labor and/or dollar amounts. Work beyond these limits will either not be required by the contract, or will be included in the indefinite quantity portion of the contract.

(2) Fixed-price contract requirements added by the user must either have clearly defined scopes, or additional historical data will have to be added to Attachment J-C8 of the PWS so that Contractors may prepare biddable estimates of the quantity of work that will be required.

b. The firm fixed-price contract line items may be displayed in one of three different ways in Section B. The user should contact the contract specialist or EFD if in doubt about which procedure should be used.

(1) Section B of the GPWS illustrates the most common procedure, which is to simply require bidders to provide a single monthly price for the total performance of all the firm fixed-price contract requirements in the contract. In this case the contract must also contain a Schedule of Deductions in Section E, in which the successful bidder will break down the total bid price for each of the fixed-price requirements in the PWS. See paragraph III.D. of the User's Guide for additional information on the "SCHEDULE OF DEDUCTIONS".

(2) A slightly different procedure would be to include a limited number of fixed-price subline items, each of which would be broken down by a Schedule of Deductions.

(3) A third procedure would be to eliminate the Schedule of Deductions from the contract and provide a detailed Schedule of Firm Fixed-Price Work. Such a schedule would be formatted similarly to the Schedule of Deductions, and bidders would provide separate unit prices for each of the fixed-price requirements in the PWS.

2. Indefinite Quantity Work Items. All items not included in the firm fixed-price portion of the contract are considered indefinite quantity work items. That is, the Contractor agrees to perform this work on an "as ordered" basis, and a fixed unit price to perform one occurrence or a given quantity of each type of work is bid. Payment for this type of work is based on the unit price bid per unit times the number of units performed. Because each Government order for indefinite quantity work is paid for separately, each and every work order must be inspected and accepted as being satisfactorily completed before payment may be made.

a. Indefinite quantity work in this GPWS is expressed in unit priced labor hours. This type of indefinite quantity work, which is also referred to as "level of effort work", should be used only in connection with maintenance, repairs, and alterations to facilities and/or equipment, and then only when such work cannot be identified in advance in sufficient detail to be included in the firm fixed-price portion of the contract. The unit prices bid include all costs to perform the work required, except for material and equipment related costs. The Contractor is reimbursed for the direct cost of materials (except for pre-expended bin materials) and equipment, plus a mark-up (fixed burden rate) to allow for material handling costs.

b. Procedures for establishing the estimated number of labor hours and material costs are described in the "MINOR WORK" of Section C. Various estimating guides, such as Engineered Performance Standards (EPS) or standards published by R. S. Means Company, may be used as a basis to determine the estimated number of labor hours required. This GPWS specifies that labor estimates will be based on EPS, since this is the most common estimating system used in facilities support contracts. Should the user choose another estimating standard, appropriate changes must be made to the GPWS technical specifications, historical data, etc.

3. Partial First Year of Performance

a. Because of funding restrictions, only four types of facilities support service contracts (custodial, grounds and surfaced areas maintenance, pest control, and guard services) may be awarded for a 12 month period to begin at any time during the fiscal year. All other contracts, including those for HVAC services must be funded using funds from the fiscal year in which the work will be performed. This means that only contracts with terms beginning on 1 October may be awarded for a full 12 month period. Contract terms beginning on any other date must be awarded for something less than 12 months and must end on or before 30 September. Normally such contracts will not be awarded for less than three months. For example, a contract which begins on 1 April would have a six month initial term, and then options to extend for up to 54 additional months. However, no single option period could be more than 12 months long, and the total term of contract could not exceed 60 months.

b. Section B of this GPWS assumes that the initial contract period will be less than 12 months. The user must also consider each of the following items in this situation.

(1) As illustrated in this GPWS, at least two sets of contract line items will be required in Section B. One set for the initial (base) period for performance of work from the specified contract start date through 30 September. The other set will be for performance during the first 12 month option period, if the Government exercises its option to extend the contract. Prices in subsequent option years may be priced separately if desired, and must be separately priced if the specification is being written for a CA program study. See paragraph IV.B of this User’s Guide.

(2) Section C, the technical specifications, must clearly outline the scope of work for both the initial and first 12 month option periods since the work load can vary significantly from month to month. For example, the specification must state whether or not annual preventive maintenance inspections will be performed during the initial period.

(3) Two Schedules of Deductions, one for the initial period and one for the first option period, must be included. Of course the items of work and number of units in the Schedules of Deductions must agree with the firm fixed-price contract line items in Section B and the scopes of work defined in Section C. Paragraph III.D of this User’s Guide provides more in depth information on the development of Schedules of Deductions.

(4) The "TERM OF THE CONTRACT" clause in Section F should read similar to the following. Check with the contract specialist for specific wording.

"TERM OF CONTRACT. The initial contract term shall be for a !INSERT NUMBER! month period commencing on !INSERT DATE! and ending on 30 September 199 ; however, the Government reserves the right to award for a base period a number of months less than the !INSERT SAME NUMBER! months stated at the unit prices bid. The Government has the option to extend the term of the contract in accordance with the "OPTION TO EXTEND THE TERM OF THE CONTRACT-SERVICES" !INSERT EITHER "(NAVFAC 52.217-10009) (SEP 88)" OR "(FAR 52.217-9) (MAR 1989)"! clause, Section I. In the option periods the Government will adjust the prices, as required, based on new Department of Labor Wage Rate Determinations."

(5) The BASIS FOR AWARD clause in Section M should read similar to the following. Check with the contract specialist for specific wording.

"BASIS FOR AWARD. The low bidder for purposes of award shall be the conforming, responsive, responsible bidder offering the lowest total price for Contract Line Items 0001, 0002, 0003, and 0004. However, the initial award will include only contract line items 0001 and 0002. Bids are solicited on an "all or none" basis and provision 52.214-10 (CONTRACT AWARD - SEALED BIDDING (Jul 1990)) in Section L is hereby modified. FAILURE TO SUBMIT BIDS FOR ALL ITEMS AND QUANTITIES LISTED SHALL BE CAUSE FOR REJECTION OF THE BID."

c. If the initial contract term will be projected to begin on 1 October, make the following changes to the GPWS contract line items, Section B:

(1) The dates shown in contract line items 0001 and 0002 should read "(1 October 19 through 30 September 19)".

(2) Delete contract line items 0003 and 0004 in their entirety, or add additional separately priced items for each of the subsequent option years (items 0005, 0006, etc.). Note that separately priced options are required if the PWS is being written under the CA program (see paragraph IV.B of this User's Guide).

4. Other Clauses. Specific clauses included in Section B differ from NAVFAC EFD to EFD. The user must contact the activity's geographical EFD to identify the specific clauses, if any, which may be required.

C. Technical Specifications (Section C). The technical specifications are the single most important part of a PWS. Within this section, the user should describe, in detail, what services are desired and when they are to be performed. Special care should be taken to ensure that the inventory of equipment and systems is complete and that preventive maintenance checks are pertinent and inspectable. Requirements provided in the GPWS are designed to meet general requirements of most activities. When tailoring this GPWS these requirements may need to be modified to meet local conditions. Special or unique requirements may need to be added. A job analysis, as described in NAVFAC MO-327, should provide the data required to tailor this section. The following information is provided for the user's consideration.

1. Service Calls

a. When determining estimated labor hour and material dollar limits for services in the "SERVICE CALLS" clause, the user should look carefully at available historical information to ensure that the limits set are reasonable. If historically a large percentage (over 90% at most activities) of service call work requires less than four labor hours for completion, it doesn't make sense to set a high upper limit, such as 40 hours. Similarly, if almost all service calls require less than $500 in material costs, do not set the upper limit at $1,000 or more. In no case may the total cost of a service call exceed $2,000, unless Davis-Bacon wage provisions are included in the contract (see User's Guide paragraph III.E).

b. In this GPWS, the Contractor receives service call requests directly from customers only after regular working hours, and is required to

respond only to emergency and urgent calls after hours. The Government receives and forwards calls received during regular working hours.

(1) The advantage of a Government operated work reception center over having the Contractor receive service calls directly from customers (especially during regular hours) is that it allows the Government to retain control over the work being performed by the Contractor.

(a) A Government work receptionist is in a better position to judge which service calls are for valid maintenance requirements, which are not for valid requirements or are not included in the scope of the contract, and which calls may be for valid requirements, but for which the work needs to be deferred. For example, if a customer calls in to report that a water cooler is not cooling, it may not make sense to issue the Contractor a service call for its repair if the unit is scheduled for replacement within the next few months. The Contractor's work receptionist would probably have no way of knowing about proposed special repair projects, scheduled equipment replacements, etc. Also, some Contractors may be tempted to respond to every single call received (whether valid or not), or to break up related tasks into separate calls in order to "bust" the service call historical data.

(b) It has been historically difficult at many activities to get Contractors to properly classify service calls according to definition as emergency, urgent, or routine. It makes more sense for the Government to make these important decisions, at least during regular working hours.

(c) It has been historically difficult at many activities to get Contractors to keep complete and accurate service call records. Multiple calls from customers for the same problem add to this problem. If the Government retains control, record keeping problems should be kept to a minimum.

(2) The advantage of a Contractor operated work reception center is that it places more complete responsibility for performance on the Contractor, and less on the Government. However, making the Contractor responsible is one thing, enforcing proper performance may not be so easy. A Contractor operated reception center also allows the Contractor to discuss problems directly with the customer, determine the best times to accomplish the work, etc.

(3) If the volume of after hours calls is very large or very small, or if it is not otherwise desired to have the Contractor receive after hours calls directly from customers, other options should be considered by the user.

(a) The Government could operate the work reception center 24 hours per day. In this case, the "After Regular Working Hours" paragraph in the "SERVICE CALLS" clause could be deleted and other paragraphs modified accordingly.

(b) The Command Duty Officer, duty SEABEE, or other designated individual could receive calls after regular hours and relay emergency and urgent requirements to the Contractor. In this case, the "After Regular Working Hours" paragraph in the "SERVICE CALLS" clause would have to specify the procedures to be used.

c. Since response to service calls after regular working hours, on weekends, and on holidays can be expensive, activities with few service calls may want to consider having civilian or military personnel receive and screen and, if necessary, respond to and complete service calls.

d. In specifying service call response and completion requirements for the PWS, the user must consider the location of the activity, the availability of materials, the geographic distribution of the equipment, and similar factors when determining the specific requirements to be included. Keep in mind that stringent response and completion requirements will increase the cost of the contract, and could result in needless contract administration complications and problems. For example, a completion requirement of three days for a routine service call is not unreasonable, but is probably not practical or necessary either. Unreasonable requirements will not only cost more, but will also not be enforceable after the contract is awarded.

e. This GPWS requires the Contractor to respond to urgent service calls both after hours and on weekends, since by definition an urgent call is a failure in service which "would soon inconvenience and/or affect the health or well being of personnel". This will prevent building occupants working on the weekend from having to get along without air conditioning, for example.

2. Preventive Maintenance Services. Experience has shown that it is best for the Government to specify specific PM frequencies and work requirements based on NAVFAC maintenance manuals and manufacturer's recommendations, rather than to have the Contractor develop and submit this type of information for approval after award of the contract. NAVFAC Publication P-717.0, *Preventive/Recurring Maintenance Handbook*, NAVFAC Manual MO-322, *Inspection of Shore Facilities*, and NAVFAC Manual MO-323, *Inspection, Maintenance and Operations Manual for Reserve Centers*, provide guidance in the preparation of PM requirements. In Attachment J-C11 of the GPWS, PM frequencies, such as annually, quarterly, etc., are specified for each given type of equipment with a list of specific equipment checks (e.g., lubricate fan motor) to be performed during each inspection provided. After award of the contract, the Contractor is required to submit a detailed work schedule based on the information provided for the Contracting Officer's approval. Such a schedule would typically include the month and week that semi-monthly and less frequent PMs would be performed, and the day of the week that weekly inspections would be performed.

D. Schedule of Deductions. If used, the "SCHEDULE OF DEDUCTIONS" clause in Section E is one of the most important items that the specification writer must consider in tailoring this GPWS, since it directly affects the degree of difficulty required to make payment deductions for unsatisfactory performance and nonperformance of work. The schedule is used if a single monthly price or a limited number of subline items are included in Section B for performance of the firm fixed-price contract requirements, and should not be used if a detailed Schedule of Firm Fixed-Price Work is included in Section B. Refer to paragraph III.B.1.b for additional information on fixed-price contract line items.

1. The Schedule of Deductions requires the successful bidder to break down the firm fixed-price portion of the bid for each of the fixed-price contract requirements in the PWS. This information is used in conjunction with the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES" and "ESTIMATING THE PRICE OF NONPERFORMED OR UNSATISFACTORY WORK" clauses (Section E), and the Performance Requirements Summary (PRS) table (Attachment J-E2), in

making payment deductions for unsatisfactory performance and nonperformance of firm fixed-price contract requirements.

2. The completed schedule must be provided by the Contractor within 15 calendar days after award of the contract, and the Government retains the right to reject and/or unilaterally establish a schedule if the submitted schedule is unbalanced or materially deficient. The specification writer must consider changes made to the technical specifications and the length of the initial contract term when tailoring the sample schedules which follow. Corresponding changes must also be made to the PRS table in Attachment J-E2.

3. The sample schedules below include separate unit prices for preventive maintenance (PM) inspections for each type of equipment and PM frequency. This reflects the fact that the cost of inspections, and therefore the amount to be deducted for nonperformance, vary with the type of equipment and type (e.g., annual, semiannual) of inspection. An alternate format would be to ask for a single price for all PMs on a given type of equipment, regardless of the frequency; or to ask for a single price for all PMs, regardless of the type of equipment or frequency. Neither of these procedures is recommended.

SCHEDULE OF DEDUCTIONS FOR BASE PERIOD
(DO NOT SUBMIT SCHEDULE OF DEDUCTIONS WITH BID)

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
1. Records and Reports (Paragraph C.7.c)				
a. Facility History Files	EACH	!INSERT!	$_____	$_____
b. Preventive Maintenance Inspection Record	EACH	!INSERT!	$_____	$_____
c. Cost Accounting Report	EACH	!INSERT!	$_____	$_____
d. Chilled Water Systems Chemical Treatment Inspection Results	EACH	!INSERT!	$_____	$_____
e. Cooling Tower Circulating Water Tests Results	EACH	!INSERT!	$_____	$_____
f. Cooling Tower Makeup Water Tests Results	EACH	!INSERT!	$_____	$_____
g. Cooling Tower Scale and Corrosion Tests Results	EACH	!INSERT!	$_____	$_____
2. Emergency Service Calls (Clause C.10)	MONTHS	!INSERT!	$_____	$_____
3. Urgent Service Calls (Clause C.10)	MONTHS	!INSERT!	$_____	$_____
4. Routine Service Calls(Clause C.10)	MONTHS	!INSERT!	$_____	$_____

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
5. Preventive Maintenance (PM) on Chillers (Clause C.12)				
a. Daily	EACH	!INSERT!	$_____	$_____
b. Weekly	EACH	!INSERT!	$_____	$_____
c. Monthly	EACH	!INSERT!	$_____	$_____
d. Semiannually	EACH	!INSERT!	$_____	$_____
e. Annually	EACH	!INSERT!	$_____	$_____
6. PM on Cooling Towers (Clause C.12)				
a. Weekly	EACH	!INSERT!	$_____	$_____
b. Monthly	EACH	!INSERT!	$_____	$_____
c. Semiannually	EACH	!INSERT!	$_____	$_____
d. Annually	EACH	!INSERT!	$_____	$_____
7. PM on Refrigeration Systems (Clause C.12)				
a. Monthly	EACH	!INSERT!	$_____	$_____
b. Semiannually	EACH	!INSERT!	$_____	$_____
c. Annually	EACH	!INSERT!	$_____	$_____
8. PM on Packaged Air Conditioning Systems (Clause C.12)				
a. Monthly	EACH	!INSERT!	$_____	$_____
b. Quarterly	EACH	!INSERT!	$_____	$_____
c. Annually	EACH	!INSERT!	$_____	$_____
9. PM on Compressed Air Systems (Clause C.12)				
a. Weekly	EACH	!INSERT!	$_____	$_____
b. Monthly	EACH	!INSERT!	$_____	$_____
c. Semiannually	EACH	!INSERT!	$_____	$_____
d. Annually	EACH	!INSERT!	$_____	$_____

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
10. PM on Air Handlers (Clause C.12)				
a. Monthly	EACH	!INSERT!	$_____	$_____
b. Quarterly	EACH	!INSERT!	$_____	$_____
c. Semiannually	EACH	!INSERT!	$_____	$_____
d. Annually	EACH	!INSERT!	$_____	$_____
11. PM on Pneumatic and Digital Control Systems (Clause C.12)				
a. Quarterly	EACH	!INSERT!	$_____	$_____
b. Annually	EACH	!INSERT!	$_____	$_____
12. Equipment Operations (Clause C.13)	MONTHS	!INSERT!	$_____	$_____
13. Start-up/Shut-down (Paragraph C.14.a)	EACH	!INSERT!	$_____	$_____
14. Filter Maintenance (Paragraph C.14.h)	EACH	!INSERT!	$_____	$_____
15. Chemical Treatment of Cooling Tower Water (Clause C.15)	MONTHS	!INSERT!	$_____	$_____
16. Chemical Treatment for Chilled Water Systems (Clause C.16)	MONTHS	!INSERT!	$_____	$_____
17. Certification of Unfired Pressure Vessels (Paragraph C.17.b)	EACH	!INSERT!	$_____	$_____
			TOTAL =	$_____
			(Must equal amount bid for Contract Line Item 0001)	

SCHEDULE OF DEDUCTIONS FOR FIRST OPTION PERIOD
(DO NOT SUBMIT SCHEDULE OF DEDUCTIONS WITH BID)

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
1. Records and Reports (Paragraph C.7.c)				
a. Facility History Files	EACH	212	$_____	$_____
b. Preventive Maintenance Inspection Records	EACH	347	$_____	$_____

	CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
	c. Cost Accounting Report	EACH	12	$_____	$_____
	d. Chilled Water Systems Chemical Treatment Inspection Results	EACH	40	$_____	$_____
	e. Cooling Tower Circulating Water Tests Results	EACH	520	$_____	$_____
	f. Cooling Tower Makeup Water Tests Results	EACH	10	$_____	$_____
	g. Cooling Tower Scale and Corrosion Tests Results	EACH	40	$_____	$_____
2.	Emergency Service Calls (Clause C.10)	MONTHS	12	$_____	$_____
3.	Urgent Service Calls (Clause C.10)	MONTHS	12	$_____	$_____
4.	Routine Service Calls (Clause C.10)	MONTHS	12	$_____	$_____
5.	Preventive Maintenance (PM) on Chillers (Clause C.12)				
	a. Daily	EACH	8030	$_____	$_____
	b. Weekly	EACH	1144	$_____	$_____
	c. Monthly	EACH	264	$_____	$_____
	d. Semiannually	EACH	44	$_____	$_____
	e. Annually	EACH	22	$_____	$_____
6.	PM on Cooling Towers (Clause C.12)				
	a. Weekly	EACH	884	$_____	$_____
	b. Monthly	EACH	204	$_____	$_____
	c. Semiannually	EACH	34	$_____	$_____
	d. Annually	EACH	17	$_____	$_____
7.	PM on Refrigeration Systems (Clause C.12)				
	a. Monthly	EACH	144	$_____	$_____
	b. Semiannually	EACH	24	$_____	$_____
	c. Annually	EACH	12	$_____	$_____

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
8. PM on Packaged Air Conditioning Systems (Clause C.12)				
a. Monthly	EACH	156	$_____	$_____
b. Quarterly	EACH	52	$_____	$_____
c. Annually	EACH	13	$_____	$_____
9. PM on Compressed Air Systems (Clause C.12)				
a. Weekly	EACH	1404	$_____	$_____
b. Monthly	EACH	324	$_____	$_____
c. Semiannually	EACH	54	$_____	$_____
d. Annually	EACH	27	$_____	$_____
10. PM on Air Handlers (Clause C.12)				
a. Monthly	EACH	4800	$_____	$_____
b. Quarterly	EACH	1600	$_____	$_____
c. Semiannually	EACH	800	$_____	$_____
d. Annually	EACH	400	$_____	$_____
11. PM on Pneumatic and Digital Control Systems (Clause C.12)				
a. Quarterly	EACH	84	$_____	$_____
b. Annually	EACH	21	$_____	$_____
12. Equipment Operations (Clause C.13)	MONTHS	12	$_____	$_____
13. Start-up/Shut-down (Paragraph C.14.a)	EACH	90	$_____	$_____
14. Filter Maintenance (Paragraph C.14.h)	EACH	3600	$_____	$_____
15. Chemical Treatment of Cooling Tower Water (Clause C.15)	MONTHS	12	$_____	$_____
16. Chemical Treatment of Chill Water Systems (Clause C.16)	MONTHS	12	$_____	$_____

CONTRACT REQUIREMENTS	UNITS	NUMBER OF UNITS	UNIT PRICE	TOTAL PRICE
17. Certification of Unfired Pressure Vessels (Paragraph C.17.b)	EACH	5	$_____	$_____

TOTAL = $_____
(Must equal amount bid for Contract Line Item 0001)

E. Davis-Bacon Considerations. A major decision which must be made early on by the specification development team is whether or not repairs and alterations to facilities will be limited in cost to $2,000 or less, or whether repairs and alterations costing more than $2,000 will be included in the HVAC services contract. Factors influencing this decision include the following.

1. General. If the total cost (labor and materials) of a one-time work effort exceeds $2,000, a Contractor providing repair and/or alteration services to Government facilities must pay employees not less than the minimum wages and fringe benefits specified in the applicable Davis-Bacon wage determination. In the case of HVAC services, the $2,000 Davis-Bacon threshold applies to any individual order for repair or system alteration services. While any facilities support service contract may contain Davis-Bacon wage provisions, only CA program contracts may contain options to extend the Davis-Bacon portion of the work without prior EFD approval.

2. Contracts Without Davis-Bacon Provisions. In contracts which do not contain Davis-Bacon provisions, work requirements greater than $2,000, such as for alterations, repairs including costly parts replacement, etc., would be considered out of the scope of the contract and would have to be procured by separate contract or performed by in-house forces. Separate contracts could include individual small purchase actions each time an over $2,000 work requirement comes up; or, if the activity has many similar work requirements over $2,000, it could develop one or more indefinite quantity facilities support construction contracts.

3. Contracts Containing Davis-Bacon Provisions. Contracts which include both Service Contract and Davis-Bacon provisions allow the Administrative Contracting Officer (ACO) to issue orders for alterations and repairs costing $2,000 or more, up to a maximum of $25,000. Since both Service Contract and Davis-Bacon wage provisions are included, the Contractor will pay the appropriate minimum wage, depending on the total cost of the delivery order. This avoids the obvious problem of having to accomplish Davis-Bacon work by other means, but as discussed below, requires additional effort in development of the specification.

a. As mentioned previously, prior EFD approval is required to include the Davis-Bacon portion of the work in the option to extend provisions of the contract. The user should contact the activity’s EFD to determine what specific justification and submittals must be provided to obtain this approval.

b. The contract line items in the Schedules of Indefinite Quantity Work, Section B, must reflect the two different wage rates included in the contract. That is, two different unit prices must be bid for most, (but not necessarily all) types of work. For example, a delivery order for repair work

will be paid for at the price bid for "Service Contract Wages" if the total cost is less than $2,000. However, if the total delivery order cost for the same type of work is greater than $2,000, Davis-Bacon Wages would apply. The abbreviated Schedule of Indefinite Quantity Work shown below illustrates how these different line items could be displayed in Section B. Contact your EFD for further guidance.

SCHEDULE OF INDEFINITE QUANTITY WORK

(Labor Subject to Service Contract Wage Rates)

0002AA	HVAC Mechanic	!NUMBER!	HR	$_____	$_____
0002AB	Helper, Maintenance Trades	!NUMBER!	HR	$_____	$_____

(Labor Subject to Davis-Bacon Wage Rates)

0002BA	HVAC Mechanic	!NUMBER!	HR	$_____	$_____
0002BB	Helper, Maintenance Trades	!NUMBER!	HR	$_____	$_____

c. The technical specifications in Section C and associated historical data in Section J of this GPWS must be tailored to account for work requirements costing more than $2,000. Typically, this will involve additions and changes to the "MINOR WORK" clause, Section C. Generally it is best to create a new category of indefinite quantity work in these clauses called "specific work", which would include any indefinite quantity requirement with a total cost exceeding $2,000. In this case "minor work" would be subject to Service Contract wage rates and "specific work" would be subject to Davis-Bacon wage rates. Of course completion requirements for specific job orders and other appropriate requirements must also be included in the tailored clause.

d. In addition to applicable Davis-Bacon wage determinations (i.e., residential, heavy construction, etc.), the contract must also contain appropriate "construction labor standard provisions" and must explain how the indefinite quantity unit prices will be adjusted due to Davis-Bacon wage rate changes in the option years. Contact your EFD to obtain the appropriate provisions.

F. Performance Requirements Summary. As the GPWS is being tailored a PRS Table should be prepared. This table will be included in Section J of the PWS and will be used primarily by the ACO, in conjunction with the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES", "ESTIMATING THE PRICE OF NONPERFORMED OR UNSATISFACTORY WORK", and "SCHEDULE OF DEDUCTIONS" clauses, in making payment deductions for unsatisfactory performance or non performance of contract requirements. Additionally, the table is also very useful in the preparation of QA plans (as discussed in the QA Guide to this GPWS) and the Schedule of Deductions, and to provide the FSCM, QAEs, and customers a convenient overview of services to be provided. A sample PRS Table, which reflects the contract requirements and work requirements of this GPWS, is provided in Attachment J-E2 of the GPWS. Suggested maximum allowable defect rates (MADRs) and weights are also shown. The user should modify this table to reflect the tailored PWS's requirements and consideration of the various factors which influence the selection of MADRs and work requirement weights.

G. Reviewing the Tailored PWS. Conflicting and contradictory contract requirements, i.e., inconsistency within a facilities support contract, inherently lead to protests, claims, and difficulties in contract administration. As a result, the Government may pay more for required services; does not obtain the services which were intended; and/or spends a great deal more in contract administration effort than would normally be warranted. To avoid such problems, the user should carefully review the tailored GPWS to find and eliminate any inconsistencies which may have been created during the tailoring process.

1. One way to eliminate inconsistencies is through the use of a matrix type check, such as that shown in Table 1 below. Such a matrix can prove to be an effective check on the consistency of the contract requirements. By matching the function with the applicable clause(s), the user can easily review those clauses which apply to a particular function without having to continually scrutinize the entire specification.

2. Another, and probably easier way for activities which have word processing software, is to perform a search on a key word(s). For example, if we wanted to review all contract requirements for "service calls" the software can then search the entire document for those key words, and stop every time it encounters them. In this way, the specification writer can quickly check for inconsistencies which may have been overlooked during previous reviews.

TABLE 1
SAMPLE MATRIX CHECK FOR HVAC SERVICES

REFERENCE	CONTRACT REQUIREMENTS				
	SERVICE CALLS	MINOR WORK	PM	EQUIPMENT OPERATIONS	START-UP/ SHUT-DOWN
C.10	X				
C.11		X			
C.12			X		
C.13				X	
C.14.a					X
J-C1				X	
J-C8	X	X			
J-C9	X				
J-C11			X		
J-C12					X
J-E2	X	X	X	X	X

IV. COMMERCIAL ACTIVITIES (CA) PROGRAM CONSIDERATIONS. This section of the User’s Guide discusses some of the special items which must be considered when using this GPWS to prepare a PWS as part of a CA program study. Included are a number of provisions and changes which must be considered by the user.

A. Scope of Work. The user must remember that the scope of work and standards of performance specified in the PWS must be equivalent to the projected capabilities of the MEO. This may require some additional tailoring of the GPWS, particularly since the GPWS is written so that single instances of repair are limited to a total cost of not more than $2,000. Since in-house performance of HVAC, refrigeration, and compressed air systems services normally includes repairs and alterations costing in excess of $2,000, such work will normally have to be included in the CA program PWS. This will require the user to make some significant changes to the contract line items (Section B) and technical specifications (Section C) of the GPWS, and to make changes to other sections of the contract in order to include Davis-Bacon wage provisions. Refer to paragraph III.E of the User's Guide for additional information and guidance on adding Davis-Bacon provisions to the PWS.

B. Separately Priced Options to Extend. OMB Circular A-76 requires in-house and Contractor bids to be evaluated on at least a three year basis, unless contract funding limitations prevent the initial contract term from being a full 12 months in length. In this situation, separately priced options must be included to cover at least two full fiscal years after the initial term. This means that Section B must contain contract line items for a base period and at least two, one year, separately priced option periods. For example:

1. If the contract term is projected to begin on 1 October, Section B would include contract line items for the base year (12 months) of performance (items 0001 and 0002) and at least two, one year, separately priced option periods (items 0003 and 0004, and 0005 and 0006).

2. If the contract term is projected to begin on 1 April, Section B would include contract line items for the initial six month base period of performance through 30 September (items 0001 and 0002), and at least two one year, separately priced option periods (items 0003 and 0004, and 0005 and 0006).

3. In no case may the total contract term exceed 60 months.

C. Continuity of Services. The PWS should address certain issues and requirements relative to the change-over from in-house to contracted performance of services. Therefore, incorporate the following paragraph in the "CONTINUITY OF SERVICES" clause in Section C. This paragraph tells the Contractor to expect delivery orders for minor work for which some or all required materials are already on hand. Such jobs will likely be left by the in-house workforce when the conversion to contract is approved.

> "At the time of the contract start date the Contractor shall be prepared to accept approximately !INSERT NUMBER! delivery orders for backlogged minor work for which materials are already on hand. These proposed delivery orders will be provided to the Contractor and a joint inventory by the Contractor and a Government Representative of all materials on hand shall be conducted within !INSERT! calendar days after the contract start date. The Contractor shall assume custody of these materials (which shall be used only for the work order for which specifically designated) upon completion of the inventory. The Government will provide the Contractor a detailed scope of work developed according to the procedures specified in the Preparation of Work Scopes for Minor Work paragraph in the "MINOR WORK" clause, Section C, for each proposed delivery order for minor work. The Contractor shall review the Government's scope of work and provide proposed unit prices for the specified equipment and for those specified materials which are not

already available in the completed inventory; indicate specific areas of disagreement with the proposed scope of work; and submit proposed scope changes in accordance with the aforementioned "Preparation of Work Scopes for Minor Work". Reviewed work scopes shall be returned to the ACO within !INSERT! calendar days after receipt for backlogged urgent minor work delivery orders, and within !INSERT! calendar days after receipt of backlogged routine minor work delivery orders. Completion dates for each backlogged minor work delivery order shall be negotiated."

D. Multi-Function CA Contracts. In many instances, CA program studies involve contracts containing more than one functional area or service. For example, the user may want to study central heating services in conjunction with HVAC, refrigeration, and compressed air systems services, and issue a single solicitation. Since most NAVFAC GPWSs are written in the same format, the technical requirements of Sections C and J of this guide may be easily combined with those of other GPWSs to produce a tailored multi-function PWS.

V. PRE-AWARD CONSIDERATIONS. Prior to award it is essential that the activity consider the following aspects of the operation and administration of a HVAC, refrigeration, and compressed air systems contract. Additionally, Chapters 5 and 6 of NAVFAC MO-327 discuss a number of items which must be considered by the activity prior to the award of a contract, including a pre-award survey of the apparent low, responsive, responsible bidder, and a review of the submitted quality control program.

A. Quality Assurance Evaluator Training. It is vitally important to have an adequate number of qualified QAEs on board prior to the contract start date. In fact NAVFAC EFD contract offices will not allow contracts to be advertised until the activity provides assurance that such resources will be provided. NAVFAC P-68, Contracting Manual, details NAVFAC policy for minimum training requirements for personnel involved in NAVFAC contracts. The manual requires all individuals assigned to QAE duties to attend the QAE training course provided by each of the EFDs within six months of their assignment, or have equivalent training as determined by the ACO. If this training has not been received, the activity should take steps to have the QAE(s) attend the next available course and in the meantime should develop a local training program. EFD Code 10s/16s should be contacted for QAE training scheduling or assistance. The QAE should have a good working knowledge of maintenance and inspection procedures and requirements for HVAC, refrigeration, and compressed air equipment, and should have preferably attended a training course on HVAC maintenance. Prior to bid opening it is essential that the QAE become familiar with the HVAC services specification.

B. Site Visits. The QAE or other Government representative should be prepared to conduct site visits with potential bidders after inviting bids. The purpose of these visits is to familiarize the Contractor with the location of contract requirements, not to provide additional information which should have been included in the PWS. QAEs must be briefed by the ACO or the Contract Specialist as to what can and cannot be said to potential bidders during site visits. Customers must also be briefed on precautions to be taken so as not to reveal sensitive information to potential bidders during these visits.

C. Government Furnished Property. Are Government furnished facilities, equipment, and materials, if any, ready for turnover? Has a property administrator been assigned as required by NAVFAC P-68, paragraph 45.303?

D. Building Monitors. Are building monitors designated to act as focal points for customer complaints? If so, have they been properly trained? Are they familiar with the specification? Has a method been developed for other customers to submit complaints to the QAE, ACO, or other designated representative?

E. Quality Assurance Plans. Are adequate QA Plans prepared and ready for use?

END OF USER'S GUIDE

GUIDE PERFORMANCE WORK STATEMENT

FOR

HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION; AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

PART I - THE SCHEDULE

SECTION B: SUPPLIES OR SERVICES AND PRICE/COSTS

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NOTE TO SPECIFICATION WRITER: Some NAVFAC Engineering Field Divisions (EFDs) require additional clauses to be added to Section B. The user must contact the appropriate geographical EFD to identify additional clauses, if any, which may be required. The numbering system for contract line items and subline items shall follow the method prescribed in Subpart 4.71 of the DOD FAR Supplement. In the following example, contract line items 0001 and 0003 are prepared as single line items supported by Schedules of Deductions. Alternate methods would be to include a limited number of subline items, each of which would be broken down by Schedules of Deductions; or to eliminate the Schedules of Deductions from the contract and prepare detailed Schedules of Firm Fixed-Price Work, with detailed contract line items similar to those in the Schedules of Deductions. See paragraph III.B.1.b of the User's Guide for additional information on contract line items.

**********!

SCHEDULE

Item No.	Supplies/Services	Maximum Quantity	* Unit	Unit Price	Amount
0001	Performance of firm-fixed price work for the BASE PERIOD in accordance with the Performance Work Statement contained in Section C.	12	MONTH	$_____	$_____
	TOTAL PRICE FOR CONTRACT LINE ITEM 0001				$_____
0002	Performance of indefinite quantity unit priced labor for the BASE PERIOD to perform specific maintenance, repair and alteration work requirements that cannot be identified in sufficient detail to be included in Contract Line Item 0001. This work is described in the "MINOR WORK" clause of Section C. The quantities listed below are realistic estimates provided solely for the purpose of bid evaluation and for establishing penal sums of bonds (if required). The price for this bid item is the total of the subline items listed in the Schedule of Indefinite Quantity Work - Unit Priced Labor.				

SCHEDULE

Item No.	Supplies/Services	Maximum Quantity	* Unit	Unit Price	Amount
	SCHEDULE OF INDEFINITE QUANTITY WORK - UNIT PRICED LABOR				
0002AA	HVAC Mechanic	!INSERT!	HR	$_____	$_____
0002AB	Laborer	!INSERT!	HR	$_____	$_____
0002AC	Electrician	!INSERT!	HR	$_____	$_____
0002AD	Plumber/Pipefitter	!INSERT!	HR	$_____	$_____
0002AE	Sheetmetal Worker	!INSERT!	HR	$_____	$_____
0002AF	Machinist	!INSERT!	HR	$_____	$_____
0002AG	Painter	!INSERT!	HR	$_____	$_____
0002AH	Equipment Operator	!INSERT!	HR	$_____	$_____
0002A?	!ADD ADDITIONAL TRADES AS NEEDED!	!INSERT!	HR	$_____	$_____
0002BA	Estimated cost for materials in the BASE PERIOD to support unit priced labor. The bid price will be calculated by multiplying the bidder's fixed burden rate (FBR) and the Government's estimated cost for materials shown below, and adding the result to the estimated amount.				
				$!INSERT! + ($!INSERT! x _____%) (FBR) =	$_____
0002CA	Estimated cost for equipment in the BASE PERIOD to support unit priced labor.				
				Estimated cost for equipment =	$!INSERT!
	TOTAL PRICE FOR CONTRACT LINE ITEM 0002				$_____

SCHEDULE

Item No.	Supplies/Services	Maximum Quantity	* Unit	Unit Price	Amount
0003	Performance of firm-fixed price work for the FIRST OPTION PERIOD in accordance with the Performance Work Statement contained in Section C.	12	MONTH	$_____	$_____
	TOTAL PRICE FOR CONTRACT LINE ITEM 0003				$_____
0004	Performance of indefinite quantity unit priced labor for the FIRST OPTION PERIOD to perform specific maintenance, repair and alteration work requirements that cannot be identified in sufficient detail to be included in Contract Line Item 0003. This work is described in the "MINOR WORK" clause of Section C. The quantities listed below are realistic estimates provided solely for the purpose of bid evaluation and for establishing penal sums of bonds (if required). The price for this bid item is the total of the subline items listed in the Schedule of Indefinite Quantity Work - Unit Priced Labor.				

SCHEDULE OF INDEFINITE QUANTITY WORK - UNIT PRICED LABOR

0004AA	HVAC Mechanic	!INSERT!	HR	$_____	$_____
0004AB	Laborer	!INSERT!	HR	$_____	$_____
0004AC	Electrician	!INSERT!	HR	$_____	$_____
0004AD	Plumber/Pipefitter	!INSERT!	HR	$_____	$_____
0004AE	Sheetmetal Worker	!INSERT!	HR	$_____	$_____
0004AF	Machinist	!INSERT!	HR	$_____	$_____
0004AG	Painter	!INSERT!	HR	$_____	$_____
0004AH	Equipment Operator	!INSERT!	HR	$_____	$_____
0004A?	!ADD ADDITIONAL TRADES AS NEEDED!	!INSERT!	HR	$_____	$_____

SCHEDULE

Item No.	Supplies/Services	Maximum Quantity	* Unit	Unit Price	Amount
0004BA	Estimated cost for materials in the FIRST OPTION PERIOD to support unit priced labor. The bid price will be calculated by multiplying the bidder's fixed burden rate (FBR) and the Government's estimated cost for materials shown below, and adding the result to the estimated amount.				
	$!INSERT! + ($!INSERT! x _____%) = $_____ (FBR)				
0004CA	Estimated cost for equipment in the FIRST OPTION PERIOD to support unit priced labor.				
	Estimated cost for equipment = $!INSERT!				
	TOTAL PRICE FOR CONTRACT LINE ITEM 0004				$_____

* FBR - Fixed Burden Rate. See "DEFINITIONS-TECHNICAL" clause, Section C.
HR - Labor Hour Unit Price. See "DEFINITIONS-TECHNICAL" clause, Section C.

END OF SECTION B

PART I - THE SCHEDULE

SECTION C: DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

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PART I - THE SCHEDULE

SECTION C: DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

!**********
NOTE TO SPECIFICATION WRITER: A "WORK EXCLUDED" clause in Section C is optional but should be used with extreme care in order to avoid giving bidders the impression that if work is not specifically excluded it is automatically included. A "WORK EXCLUDED" clause may be useful to clarify the scope of work if some Heating, Ventilating, Air Conditioning (HVAC), refrigeration, and compressed air plant functions are already being performed by contract.
**********!

C.1 GENERAL INTENTION. The intention of this solicitation is to obtain operation, maintenance, and repair services for heating, ventilating, and air conditioning (HVAC), refrigeration, and compressed air equipment and systems at !INSERT NAME OF ACTIVITY! by means of a combination firm fixed-price and indefinite quantity contract.

C.2 GENERAL REQUIREMENTS. The Contractor shall provide all labor, supervision, tools, materials, equipment, transportation, and management necessary to operate, maintain, repair, and make minor alterations to HVAC, refrigeration, and compressed air systems and associated equipment in accordance with the requirements specified herein. Attachment J-C1 describes the equipment and systems to which services shall be provided. The work includes the performance of service work; recurring services such as preventive maintenance, cooling tower water treatment, and seasonal start-up and shut-down of equipment; periodic operational checks; and indefinite quantity work items of repair and alterations.

a. Services shall be provided on the following types of equipment, as listed in Attachment J-C1.

(1) Air conditioning equipment and systems, including reverse cycle cooling/heating systems, electrical resistance strip heating elements in window and through the wall type units, package units, and split/central system units with factory built-in elements and contained within the evaporator/air handling unit cabinet as an integral part of the system.

(2) Absorption, centrifugal, screw machine, and reciprocating water chiller systems.

(3) Cooling towers, structures, components, and systems.

(4) Evaporative cooling systems.

(5) Ventilation equipment and systems.

(6) Refrigeration equipment and systems.

(7) Compressed air plants and systems, including high pressure service.

(8) Vacuum pumps and systems.

(9) Pneumatic, electrical, and electronic controls and systems.

(10) Miscellaneous equipment and facilities and systems.

(11) Condenser water systems chemical treatment.

(12) Chill water systems chemical treatment.

(13) Peripheral systems.

(14) Any additional equipment which may be added by the Government to Attachment J-C1. If such additions result in an increase or decrease in contract requirements, the contract price will be adjusted in accordance with the "CHANGES" clause, Section I.

!**********
NOTE TO SPECIFICATION WRITER: The equipment and services excluded below are those typically excluded. The user must modify this list to fit local requirements.
**********!

b. The following equipment and services are excluded from the scope of this contract and will not be provided by the Contractor:

(1) Hot water and steam heating coils other than those coils specifically included under other portions of the contract.

(2) Equipment included in another contract.

(3) Electronically controlled fire dampers and smoke detection systems.

c. The Government makes no representation or guarantee as to the condition of equipment on the start date of the contract, and no adjustments will be made in contract price relative to equipment condition after award. A site visit and inspection of equipment condition is strongly encouraged.

!**********
NOTE TO SPECIFICATION WRITER: Unique functional terms should be added to the following list of definitions. Definitions not required should be deleted.
**********!

C.3 DEFINITIONS - TECHNICAL. As used throughout this contract, the following terms shall have the meaning set forth below. Additional definitions are in the "DEFINITIONS" clause in Section I.

a. Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.

b. Where "as directed", "as required", "as permitted", "approval", "acceptance", or words of similar import are used, it shall be understood that direction, requirement, permission, approval, or acceptance of the ACO is intended unless stated otherwise.

c. Additional Material Handling. Time expended for loading materials from storage to truck, unloading materials to work area, moving materials to work area, moving materials from storage to job site, removing debris, and handling

of materials during the job that is not included in the craft time standard. The above definition is a summary of the definition of "Additional Material Handling" as used in development of Engineered Performance Standards.

d. Administrative Contracting Officer (ACO). The individual designated by the Contracting Officer to administer the contract. Throughout this contract, the term ACO will be used to refer to the individual designated to administer the contract or his/her designated representative. See the "DEFINITIONS" clause, Section I.

e. Alteration. An alteration includes all work necessary to provide a new complete and usable HVAC, refrigeration, or compressed air system; or to provide a complete and usable addition to an existing system.

f. Check. Check includes examination and the performance of parts replacement, lubrication, adjustment, calibration, cleaning, repair, etc.

g. Contractor. The term Contractor as used herein refers to both the prime Contractor and any subcontractors. The prime Contractor shall ensure that subcontractors comply with the provisions of this contract.

h. Contractor Representative. A foreman or superintendent assigned in accordance with the "CONTRACTOR EMPLOYEES" clause, Section H.

i. Craft Phase. The numbered chronological sequence in which a specific craft performs a job phase.

EXAMPLE

Job Phase	Craft Phase	Craft	Description
1	1	Carpenter	Fabricate and install frame for new wall
2	1	Electrician	Rough in electrical
3	2	Carpenter	Install sheet rock
4	2	Electrician	Trim out electrical
5	1	Painter	Paint new wall

j. Delay Allowances. Time expended for planning the work in the shop and at the job site; personal needs; balancing delay waiting for other craftsmen; unavoidable delays; partial day influence; waiting for tools or material that should have been at the job site. The above definition is a summary of the definition of "Delay Allowances" as used in development of Engineered Performance Standards.

k. Direct Material Costs. The actual vendor invoice charges for materials used for performance of work under this contract. Direct material costs shall include transportation charges when such charges are included on the invoice by the vendor, as well as any discounts allowed for prompt payment and discounts or rebates for core value or salvage value that accrue to the Contractor. When questions arise concerning the cost of materials, material costs will be based on the lowest of quotes provided by the Contractor from at least three different

commercial vendors for the direct material cost. The Government retains the right to obtain additional quotes in questionable situations. The lowest price will be used.

l. Engineered Performance Standards (EPS). A job estimating system developed for the Department of Defense. EPS is the average time necessary for a qualified craftsman working at a normal pace, following acceptable trade methods, receiving capable supervision, and experiencing normal delays to perform defined amounts of work of a specified quality. EPS manuals are published under the following numbers by each military branch:

Navy:	NAVFAC P 700 Series
Army:	TB 420 Series
Air Force:	AFM 85 series

m. Facility. An establishment, structure, or assembly of units of equipment designated for a specific function.

n. Fixed Burden Rate (FBR). The additional costs (expressed in percent of direct material cost) for ordering, handling, and stockpiling materials for work included in the indefinite quantity, unit priced labor portion of the contract.

o. Frequency of Service

(1) Annual (A). Services performed once during each 12 month period of the contract.

(2) Semiannual (SA). Services performed twice during each 12 month period of the contract at intervals of 160 to 200 calendar days.

(3) Quarterly (Q). Services performed four times during each 12 month period of the contract at intervals of 80 to 100 calendar days.

(4) Monthly (M). Services performed 12 times during each 12 month period of the contract at intervals of 28 to 31 calendar days.

(5) Semimonthly (SM). Services performed 24 times during each 12 month period of the contract at intervals of 14 to 16 calendar days.

(6) Weekly (W). Services performed 52 times during each 12 month period of the contract at intervals of six to eight calendar days.

(7) Daily (D5). Services performed once each day, Monday through Friday, including holidays unless otherwise noted.

(8) Daily (D7). Services performed once each day, seven days per week, including weekends and holidays.

p. Inspect. Inspect includes examination and the performance of parts replacement, lubrication, adjustment, calibration, cleaning, repair, etc.

q. Job Phase. The numbered chronological sequence in which work is accomplished regardless of the craft(s) involved. (See Craft Phase above.)

r. Job Preparation. All work and costs associated with receiving and considering a job assignment and instructions; planning equipment and material

requirements; obtaining proper tools; laying out tools, material, and equipment; setting up ready to begin work; cleaning and storing tools and equipment; and cleanup of job site.

!**
NOTE TO SPECIFICATION WRITER: The following definition assumes that no Government furnished facilities (which are located in EPS travel zone zero) are to be provided for the Contractor's use. If such facilities are to be provided the user should consider deleting the words "for travel" in the third sentence.
**!

s. Labor Hour Unit Price. A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing a standard hour of work. The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity (i.e. the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s)); and all costs for travel, pre-expended bin materials and supplies, profit, tools, equipment, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

t. Latent Defects. Latent defects are defects that are present in a hidden or undeveloped state and are not visible or apparent at the time of inspection, but which become obvious or come into being at some future time.

u. Pre-expended bin materials and supplies. The minor materials and supplies that are incidental to a job, and for which the total direct cost of any one material line item shown on the material estimate is $10.00 or less. Examples of pre-expended bin materials and supplies include, but are not limited to, solder, lead, flux, electrical connectors, electrical tape, fuses, nails, screws, bolts, nuts, washers, spacers, masking tape, sand paper, solvent, cleaners, lubricants, grease, oil, rags, mops, glue, epoxy, spackling compound, joint tape, gases, refrigerants, refrigeration fittings, plumbers tape and compound, clips, welding rods, heat sinks, touch up paint, and plumbing fittings.

v. Quality Assurance (QA). A method used by the Government to provide some measure of control over the quality of purchased goods and services received.

w. Quality Assurance Evaluator (QAE). The Government employee designated by the ACO to be responsible for the monitoring of Contractor performance.

x. Quality Control (QC). A method used by the Contractor, to control the quality of goods and services produced.

y. Regular Working Hours. The Government's regular (normal) working hours are from !STARTING HOUR! to !ENDING HOUR!, Mondays through Fridays except (a) Federal Holidays and (b) other days specifically designated by the ACO.

z. Repair. Repair is the restoration of a piece of equipment, a system, or a facility to such condition that it may be effectively utilized for its designated purposes. Repair may be overhaul, reprocessing, or replacement of constituent parts or materials that have deteriorated by action of the elements

or usage and have not been corrected through maintenance, or replacement of the entire unit or system if beyond economical repair.

aa. Response Time. Response is defined as the time allowed the Contractor after initial notification of a work requirement to be physically on the premises at the work site, with appropriate tools, equipment, and materials, ready to perform the work required. Response times are designated in the appropriate technical clauses in Section C.

bb. Travel Time. Time expended between shop and the job site; waiting for vehicle; getting in and out of vehicle; loading and carrying a tool box; vehicle travel; unloading, walking from vehicle to job site; opening and closing door; walking up and down stairs; using elevators; and access to secure or controlled areas.

cc. Work Content Comparison. Work content comparison is a method of comparing a task that is not specifically defined in EPS Task Time Standards to a very similar task that is defined in the EPS Task Time Standards. This definition is a summary of a more detailed definition which appears on page 37 of the EPS Planner and Estimator's Deskguide (NAVFAC P-701.0).

!**********
NOTE TO SPECIFICATION WRITER: Government furnished property may include real property or personal property. The specification writer must clearly identify Government furnished facilities, Government furnished equipment (GFE), and Government furnished material (GFM), if any. The following clauses should be modified as needed to fit the activity's specific situation and needs. Remember that if a CA program study is being conducted, decisions on whether or not to provide Government furnished facilities and equipment must be based on an economic analysis. Refer to OPNAVINST 4860.7B.
**********!

C.4 GOVERNMENT FURNISHED PROPERTY AND SERVICES. In accordance with the "GOVERNMENT FURNISHED PROPERTY (FIXED-PRICE CONTRACTS)" clause in Section I, the Government will provide the Contractor the option of using certain Government owned !MODIFY AS REQUIRED! facilities, equipment, materials, and utilities for use only in connection with this contract. The use of Government furnished property and services for other purposes is prohibited. All such facilities, equipment, and materials will be provided in "as is" condition.

!SELECT EITHER a. OR a.(OPTIONAL)!

a. Government Furnished Facilities. The Government will furnish or make available to the Contractor the facilities described in Attachment J-C2. The Contractor shall be responsible and accountable for such facilities accepted for use and shall take adequate precautions to prevent fire hazards, odors, and vermin. Janitorial services for Government furnished facilities shall be provided by the Contractor. The Contractor shall obtain written approval from the ACO prior to making any modifications or alterations to the facilities. Any such modifications or alterations approved by the Government will be made at the expense of the Contractor. At the completion of the contract, all facilities shall be returned to the Government in the same condition as received, except for reasonable wear and tear. The Contractor shall be held responsible for the cost of any repairs caused by negligence or abuse on his/her part, or on the part of his/her employees.

a.(OPTIONAL) Government Furnished Facilities. The Government will not provide office space and operational facilities to the Contractor. The Contractor shall secure and maintain the necessary office space and other facilities required for the performance of this contract at his/her own expense.

!**********!
NOTE TO SPECIFICATION WRITER: The specification writer must determine what equipment and material will be provided to the Contractor and select from the following paragraphs as appropriate. Equipment and material should normally not be provided to the Contractor unless economically justified under a CA program study. Extensive equipment and material listings should be placed in Attachments J-C3 and J-C4 respectively, including identification number, age, location, quantity, size or capacity, etc. Specific maintenance requirements beyond the general requirements of this clause should also be detailed in these Attachments. If items are located at other than Government furnished facilities, specify location and responsibility for transportation. If no equipment or material will be provided to the Contractor, the OPTIONAL clauses should be used.
**********!

!SELECT EITHER b. OR b.(OPTIONAL)!

b. Government Furnished Equipment. The Government will provide the Contractor the use of existing and available Government owned tools and equipment in the performance of the contract. Such Government furnished tools and equipment are listed in Attachment J-C3.

(1) The Contractor shall provide periodic servicing, maintenance, and repair of the equipment accepted for use at no cost to the Government, and the total or partial breakdown or failure of the Government furnished equipment shall not relieve the Contractor of responsibility to fully perform the work of the contract. Upon completion or termination of the contract, all Government owned equipment shall be returned to the Government in the same condition as received, except for normal wear and tear. Equipment which becomes worn out due to normal wear and tear shall be returned to the Government and its replacement shall be the responsibility of the Contractor at no cost to the Government. Equipment so acquired shall remain the property of the Contractor. The Contractor shall be responsible for the cost of any repairs or replacement caused by negligence or abuse by the Contractor or his/her employees.

(2) The Contractor and the ACO shall conduct a joint inventory before commencing work under this contract to determine the exact number and serviceability of Government furnished equipment. The Contractor shall then certify the findings of this inventory, assume accounting responsibility, and subsequently report inventory discrepancies to the ACO. Government furnished equipment shall not be removed from the military base unless approved by the ACO in writing.

b.(OPTIONAL) Government Furnished Equipment. The Contractor shall furnish all tools and equipment required for the performance of this contract. The Government will not provide tools or equipment to the Contractor.

!SELECT EITHER c. OR c.(OPTIONAL)!

c. Government Furnished Material. The Government will furnish the material described in Attachment J-C4 to the Contractor on a one time basis. The

Contractor and the ACO shall conduct a joint inventory before commencing work under this contract to determine the exact amount and serviceability of Government furnished materials. The Contractor shall then certify the findings of this inventory, assume accounting responsibility for all materials supplied, and shall provide documentation supporting issue/use of such material. Upon depletion of material provided to the Contractor by the Government, the Contractor shall furnish all material to perform the work of the contract, except as otherwise specified herein. Upon completion or termination of this contract a second joint inventory shall be conducted, if necessary, of all unused Government furnished materials. The Contractor shall be held liable for all materials which cannot be accounted for by issue/use documentation.

c.(OPTIONAL) Government Furnished Material. The Government will not provide any materials to the Contractor.

!**********!

NOTE TO SPECIFICATION WRITER: The intent of the insurance item portion of the following optional paragraph is for the Government to provide the Contractor a minimum initial issue of critical, hard to come by parts, then require the Contractor to maintain no less than that quantity on hand at all times so that repairs to critical equipment/systems will not be delayed by long material delivery times. Typical insurance items would include out of stock components on very old mechanical equipment that would need to be specially produced by the manufacturer. **Do not** attempt to use this paragraph to force the Contractor to maintain minimum stock levels of ordinary repair parts/materials.

!**********!

c.(OPTIONAL) Government Furnished Material. The Government will furnish the material described in Attachment J-C4 to the Contractor on a one time basis. The Contractor and the ACO shall conduct a joint inventory before commencing work under this contract to determine the exact amount and serviceability of Government furnished materials. The Contractor shall then certify the findings of this inventory, assume accounting responsibility for all materials supplied, and shall provide documentation supporting issue/use of such material.

(1) Upon depletion of material provided to the Contractor by the Government, as listed in Part A of Attachment J-C4, the Contractor shall furnish all material to perform the work of the contract, except as otherwise specified herein. Upon completion or termination of this contract a second joint inventory shall be conducted, if necessary, of all unused Government furnished materials, as listed in Part A of Attachment J-C4. The Contractor shall be held liable for all materials missing which cannot be accounted for by issue/use documentation.

(2) Experience has shown that certain repair parts and materials requiring long procurement lead times must be stocked and on hand to insure that timely repairs may be made to critical equipment. A list of these so called "insurance items" and minimum stocking levels are contained in Part B of Attachment J-C4. The Government will provide the Contractor an initial issue of all items in at least the minimum quantities listed in Part B of Attachment J-C4. The Contractor shall maintain at least the minimum quantity of all the items specified. These items shall be used by the Contractor in the maintenance and repair of the facilities/systems only as follows:

(a) Insurance items shall be used on the systems, facilities, or GFE with which they are associated.

(b) A replacement insurance item shall be ordered within three working days after the use of any insurance item which causes the total quantity on hand to fall below the minimum specified level. The Contractor shall bear the cost of replacement of all insurance items.

(c) Upon completion or termination of the contract, all insurance items shall be returned to the Government in the minimum specified quantities.

d. Availability of Utilities. The Government will furnish the following utility services at existing outlets, for use in those facilities provided by the Government and as may be required for the work to be performed under the contract: electricity, steam, natural gas, fresh water, sewage service, and refuse collection (from existing collection points). Information concerning the location of existing outlets may be obtained from the ACO. The Contractor shall provide and maintain, at his/her expense, the necessary service lines from existing Government outlets to the site of work.

!SELECT EITHER (1) OR (1)(OPTIONAL)!

(1) Utilities specified above will be furnished at no cost to the Contractor.

(1)(OPTIONAL) The Contractor shall pay for utilities consumed and shall, at his/her expense, install meters as required by the ACO to measure consumption of utilities provided by the Government. Rates for reimbursement to the Government of metered utilities will be: !LIST THE RATES OF REIMBURSEMENT PER TYPE OF SERVICE PROVIDED!

(2) A restricted telephone line (USOC Class RS4) for on base calls will be provided by the Government at no cost to the Contractor. The Contractor shall install commercial telephone service, and all service and toll charges shall be paid for by the Contractor.

C.5. CONTRACTOR FURNISHED ITEMS. Except for the items listed in clause C.4, the Contractor shall provide all facilities, equipment, materials, and services to perform the requirements of this contract. The Contractor shall provide new or factory reconditioned parts and components when providing maintenance and repair services as described herein. All replacement units, parts, components, and materials to be used in the maintenance, repair, and alteration of facilities and of equipment shall be compatible with that existing equipment on which it is to be used; shall be of equal or better quality than original equipment specifications; shall comply with applicable Government, commercial, or industrial standards such as American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE), National Board of Underwriters or Underwriters' Laboratories, Inc., National Electrical Manufacturer's Association, etc; and used in accordance with original design and manufacturer intent. If the original manufacturer has updated the quality of parts for current production, parts supplied under this contract shall equal or exceed the updated quality. The Contractor shall retain the parts replaced for at least 10 working days after completion of the job and make these parts readily available for inspection by the ACO upon request. When disputes arise concerning material, equipment, and components selected for work items already accomplished, the Contractor shall, at no cost to the Government, remove, replace, and/or rework material, equipment, and components so that compliance with the Government's requirements are satisfied. The Contractor shall obtain

and maintain manufacturer's operating instructions and maintenance manuals on all new equipment installed by the Contractor. These documents shall become property of the Government and shall be turned into the ACO within five working days after completion or termination of the contract.

C.6 WORK OUTSIDE REGULAR HOURS. Except as may otherwise be specified, all work shall be performed during regular working hours. If the Contractor desires to carry on work on Saturday, Sunday, holidays, or outside regular working hours, he/she must submit application to the ACO for approval.

C.7 MANAGEMENT. The Contractor shall manage the total work effort associated with the operations, maintenance, repair, and all other services required herein to assure fully adequate and timely completion of these services. Included in this function are a full range of management duties including, but not limited to, planning, scheduling, cost accounting, report preparation, establishing and maintaining records, and quality control. The Contractor shall provide an adequate staff of personnel with the necessary management expertise to assure the performance of the work in accordance with sound and efficient management practices.

a. Work Control. The Contractor shall implement all necessary work control procedures to ensure timely accomplishment of work requirements, as well as to permit tracking of work in progress. The Contractor shall plan and schedule work to assure material, labor, and equipment are available to complete work requirements within the specified time limits and in conformance with the quality standards established herein. Verbal scheduling and status reports shall be provided when requested by the ACO. The status of any item of work must be provided within !INSERT! hours of the request during normal working hours, and within !INSERT! hours after regular working hours.

b. Work Schedule. The Contractor shall schedule and arrange work so as to cause the least interference with the normal occurrence of Government business and mission. In those cases where some interference may be essentially unavoidable, the Contractor shall be responsible to make every effort to minimize the impact of the interference, inconvenience, equipment downtime, interrupted service, customer discomfort, etc.

(1) Building Custodians. Within ten calendar days following award of this contract, the ACO will provide the Contractor with a list of building custodians. The Contractor shall notify the custodian of any work to be performed in a building under his control that would tend to disrupt the conduct of normal Government business. The Contractor shall notify the custodian at least two working days in advance of such scheduled work. Notification shall include the type of work to be done and the estimated completion date. The Contractor shall reschedule any work that the ACO deems necessary to avoid unacceptable disruptions in the Government's business.

(2) Notice of Equipment Shut-Downs. Prior approval shall be obtained from the ACO, except in emergencies, for work requiring shut-down of equipment for more than thirty minutes during regular work hours. All such requests must be submitted at least 72 hours in advance. In cases where shut-down is necessary, the Contractor shall coordinate the shut-down with the Building Custodian or other designated representative in that affected building.

!**********
NOTE TO SPECIFICATION WRITER: Reports and information which the Government

periodically needs from the Contractor should be listed in Attachment J-C5. Report formats, required information, etc. should be discussed in detail in this attachment. If facility history files are to be maintained by the Government, tailor the following paragraphs accordingly.
**********!

c. Records and Reports. The Contractor shall maintain management, operation, and maintenance records and prepare management, operation, and maintenance reports as set forth in Attachment J-C5, "LIST OF REQUIRED RECORDS AND REPORTS". All records and copies of reports shall be turned over to the ACO within five calendar days after contract completion.

(1) A completed work file for each structure (identified by structure number) shall be maintained by the Contractor. Each file shall contain a listing of all equipment in Attachment J-C1 contained in the structure by nomenclature and manufacturer's model number, as well as all manufacturer's literature, brochures, and pamphlets; maintenance, operator's, and parts list manuals; warranty information; a copy of all completed Service Call Work Authorization Forms, minor job orders, and Preventive Maintenance Inspection Record forms; and other information pertaining to the facility and/or installed equipment and systems. The Government will have access to these files upon request. All documents shall be filed within 10 calendar days of the completed transaction, with the exception of Preventive Maintenance Inspection Record forms, which shall be filed within two working days after the completion of each preventive maintenance inspection. The entire file shall be turned over to the Government upon completion of the contract.

(2) Cost accounting information shall be maintained and reports submitted in compliance with the specific requirements set forth in Attachment J-C5. This report shall be submitted with, and is considered part of, the monthly payment invoice.

d. Staffing. The Contractor shall continuously maintain an adequate staff with management expertise to assure work is scheduled and completed in accordance with these specifications. The Contractor shall maintain an adequate craft workforce to complete work in accordance with the time and quality standards specified.

C.8 CONTINUITY OF SERVICES. To ensure continuity of essential services, the successful bidder shall be prepared to fully commence work on the start date of this contract, and should not assume that Government or previous Contractor employees will be available to guide, direct, or specifically orientate each Contractor employee.

C.9 GENERAL REQUIREMENTS AND PROCEDURES

a. Standards. All work shall meet the standards specified herein and shall be accomplished in conformance with approved and accepted standards of the Air Conditioning and Refrigeration trades industry; the equipment manufacturer; all applicable activity, local, state, and federal standards; and all applicable building and safety codes.

(1) When the Contractor completes work on a system, that system shall be free of missing components or defects which would prevent it from functioning as originally intended and/or designed. Corrective or repair/replacement work shall be carried to completion including operational checks and cleanup of the

job site. Except where otherwise noted, replacements shall match existing in dimensions, finish, color, design, and function.

(2) During and at completion of work, debris shall not be allowed to spread unnecessarily into adjacent areas nor accumulate in the work area itself. All such debris, excess material, and parts shall be cleaned up and removed at the completion of the job and/or at the end of each day work is in progress.

b. Major Repairs. Major repair is not included within the scope of this contract. Major repair is defined as any individual unit or incident of repair or replacement with a total estimated cost (labor and direct material) exceeding $2,000. Major repairs will normally be accomplished by separate contract or by Government forces. This exclusion does not apply if the repair is required to correct damage caused by the Contractor's negligence.

c. Replacement, Modernization, Renovation. During the term of the contract, the Government may replace, renovate, or improve equipment, systems, and components at the Government's expense and by means not associated with this contract. All replaced, improved, updated, modernized or renovated equipment, components, and systems shall be maintained, operated, and/or repaired by the Contractor at no additional cost to the Government unless such changes result in an increase or decrease in contract requirements. Equipment changes, replacements, or deletions which result in an increase or decrease in contract requirements will result in adjustments to the contract price in accordance with the "CHANGES" clause, Section I.

d. Equipment Under Manufacturer's or Installer's Warranty. Equipment, components, and parts, other than that installed under this contract, shall not be removed or replaced or deficiencies corrected while still under warranty of the manufacturer or the installer without prior approval of the ACO. All defects in material or workmanship, defective parts, or improper installation and adjustments found by the Contractor shall be reported to the ACO so that necessary action may be taken. The Contractor shall be knowledgeable of the equipment, parts, and components that are covered by warranty and the duration of such warranties. Available warranty information will be furnished to the Contractor by the ACO.

e. Refrigerant Recycling. The Contractor shall not knowingly vent or otherwise dispose of any refrigerant in a manner which would permit their release into the environment. Refrigerants shall be captured and recycled in conformance with all applicable federal, state, and local laws and regulations.

f. As-Built Drawings

(1) Attachment J-C6 contains a list of those drawings which will be available to the Contractor for information only. The Government makes no representation as to the completeness or accuracy of these drawings.

(2) All changes or additions to equipment and systems and the related buildings and structures made by the Contractor shall be recorded by the Contractor and provided to the ACO within !INSERT NUMBER! calendar days of the completed work. This data shall include, but is not limited to, dimensioned drawings and/or sketches.

!**********
NOTE TO SPECIFICATION WRITER: Modify or delete the following paragraph as

required to specify where the Contractor's responsibility for a piece of equipment ends (such as in C.9.g(1) below), and whether supporting services such as electricity and water to equipment are provided and maintained by the Government or another Contractor. Any other related services and support provided by other Contractors or in-house forces must also be detailed. For example, if another Contractor operates a system to be maintained under this contract, the responsibilities of each must be specifically spelled out.
**********!

g. Interface With Other Contractors and Government Forces.

(1) Supporting Services. The Government !AND/OR OTHER CONTRACTOR! will furnish electricity of proper voltage and current capacity to the last disconnect switch nearest the item of equipment for each equipment system (unless otherwise specified elsewhere in the contract); water of sufficient quantity for each required application; and where re-heat is required for humidity/temperature control, sufficient hot water and/or steam to the controlling device.

(2) Cooperation With Other Contractors. Attention is invited to the fact that other Contractors !AND/OR IN-HOUSE FORCES! are engaged in similar and supporting work, requiring close cooperation. The Contractor for this contract shall cooperate with all other Contractors and avoid conflicts with other Contractor's performance and work schedules. In the event of conflicts with other Contractors that cannot be satisfactorily resolved, the matter shall be referred to the ACO for decision. Such decisions shall be final, subject to right of appeal in accordance with the terms of the contract.

h. Electrical Power and Water (Utilities) Outages. The Contractor shall shut-down, restart, and perform operational checks on all equipment affected by both scheduled and unscheduled utilities outages at no additional cost to the Government. The Contractor will be informed by the ACO as far in advance as time permits of dates, times, building(s), and equipment that will be affected by such utilities outages.

i. Reporting Equipment Deficiencies. Any equipment deficiencies noted by the Contractor during operational checks, preventive maintenance inspections, service work, or at any other time shall be reported in writing to the Government's work control center.

(1) Deficiencies discovered which could potentially jeopardize the operation of items of equipment in the critical facilities listed in Attachment J-C7 shall be reported by phone immediately, but not more than !INSERT! hours after discovery, and followed up by written notice within !INSERT! hours. Deficiencies noted which could potentially jeopardize the operation of equipment in all other facilities shall be reported within !INSERT! hours after discovery.

(2) All non operation threatening deficiencies shall be reported on completed Service Call Work Authorization Forms and Preventive Maintenance Completion Reports. If discovered during operational checks deficiencies shall be reported not later than 9:00 AM the following work day.

j. Freeze Protection. The Contractor shall shut down, secure, and drain all equipment subject to freeze damage when freezing weather conditions are forecast, anticipated or imminent. The Contractor is responsible for and liable to provide such services whether or not specifically informed or notified by the

ACO or others, of such conditions. All equipment secured and drained for these reasons shall be returned to normal service as soon as possible when danger of freeze conditions has passed. The Contractor shall be liable for correction of any and all damages incurred as a result of failure to adequately protect equipment under these conditions. The Contractor shall notify the Government's work control center (or Officer of the Day if after regular working hours) no later than !INSERT! hours after securing a system from possible freeze damage. All work associated with freeze protection is included in the fixed-price portion of the contract.

k. Equipment Damages Caused by Weather Conditions or Vandalism. Work required to repair equipment damaged by inclement weather conditions (other than freezing) and/or acts of vandalism shall be performed at no additional cost to the Government if such work is within the scope of a service call. The historical data in Attachment J-C8 includes such instances of repair.

!**********
NOTE TO SPECIFICATION WRITER: Tailor the following paragraphs as required. Paragraph III.C of the User's Guide provides user considerations.
**********!

C.10 SERVICE CALLS. Service calls are defined as maintenance, repair, alteration or other miscellaneous work requirements which are either called into the work reception center by building occupants or generated by designated Government representatives; are brief in scope; require not more than !INSERT NUMBER! estimated total labor hours for accomplishment; require not more than !INSERT DOLLAR VALUE! in total direct material costs, to include parts or entire unit replacement; and do not reasonably require detailed job planning. All service work is included in the firm fixed-price portion of the contract. When questions arise concerning the labor hours required for a particular job, labor hour requirements will be based on Engineered Performance Standards (EPS) Manuals (NAVFAC P-700 series) or, if not applicable, other estimating sources. When questions arise concerning the costs of materials, material costs will be based on the lowest of quotes provided by the Contractor from at least three different commercial vendors for the actual direct cost of materials. The Government retains the right to obtain additional quotes in questionable situations. The lowest price will be used.

a. Service Call Reception

(1) Normal Working Hours. The Government's work reception center will receive service call requests during normal working hours and classify each call in accordance with the definitions provided below. A description of the problem or requested work, date and time received, location, and other appropriate information will be placed on a Service Call Work Authorization Form (see Attachment J-C9) and made available for pickup by the Contractor at the Government's work reception center. If the call is classified as emergency or urgent the Government's work receptionist will notify the Contractor by phone that a call has been received and that a work authorization form is available for pickup.

(2) After Normal Working Hours. The Contractor shall receive all service call requests directly from building occupants and authorized Government representatives after normal working hours, on weekends, and holidays. Calls will be received and classified by the Contractor as emergency, urgent, or routine in accordance with the definitions provided in the "Service Call

Classification" paragraph of this clause, and responded to accordingly. If the call is classified as emergency or urgent, the Contractor shall fill out a Service Call Work Authorization Form, including order number, description of the problem, date and time received, building number, and caller's name and telephone number. If the call is classified as routine the Contractor shall record the same information, but will not fill out a work authorization form. One copy of each emergency and urgent work authorization form and a log of all routine calls received shall be delivered to the Government's work reception center by !INSERT TIME! the next regular working day. Authorized Government representatives may upgrade or downgrade the classification of any service call received by the Contractor.

b. Service Call Classification

(1) Emergency Calls. Service calls will be classified as emergency at the discretion of the ACO. Generally, emergency calls will consist of correcting failures which constitute an immediate danger to personnel, threaten to damage property, threaten to disrupt activity operations and/or training missions, or affect the operation of critical equipment or systems as identified in Attachment J-C7. No more than !INSERT PERCENTAGE! of the service calls issued to the Contractor will be classified as emergency.

(2) Urgent Calls. Service calls will be classified as urgent at the discretion of the ACO. Generally, urgent calls will consist of providing services or correcting failures which do not immediately threaten personnel, property, or activity missions; but which would soon inconvenience and/or affect the health or well being of personnel, lead to property damage, or lead to disruptions in operational and/or training missions. Calls will also be classified as urgent when the service or failure has upper level command/management attention. No more than !INSERT PERCENTAGE! of the service calls issued to the Contractor will be classified as urgent.

(3) Routine Calls. Service calls will be classified as routine calls when the work does not qualify as an emergency or urgent call.

c. Response to Service Calls. The Contractor shall have adequate procedures for picking up service call work authorizations from the Government's work reception center during normal working hours, and for receiving and responding to emergency and urgent service calls 24 hours per day, including weekends and during holidays. A single local telephone number shall be provided by the Contractor for receipt of all service calls. All telephone calls shall be answered within 30 seconds by an individual fully familiar with the Contractor's work control procedures and the terms and conditions of this contract. Emergency and urgent calls shall be considered received by the Contractor at the time and date the telephone call is placed by the work reception center or other authorized Government representative. Routine calls shall be considered as received by the Contractor at the time and date the work reception center makes the work authorization available for pick up.

!**********
NOTE TO SPECIFICATION WRITER: The user must insert response and completion times as required to suit the activity's needs.
**********!

(1) Response by Classification

(a) Emergency Calls. The Contractor shall respond immediately and must be on the job site and working within !INSERT NUMBER! minutes after receipt of an emergency service call. The Contractor shall work continuously without interruption and shall arrest the emergency condition before departing the job site (e.g. return critical system to operation, install portable centrifugal chiller system, secure power to eliminate electrical hazard, etc.). If further labor and material are required to complete the repair, the call will be reclassified as either urgent or routine, as appropriate, and the corresponding completion time will then apply. Such follow-up work shall be considered part of the original service call. If the follow-up work is beyond the scope of a service call, the procedures in paragraphs C.10.c(2) or C.10.c(3) below shall apply.

(b) Urgent Calls. The Contractor shall be on the job site and working within !INSERT NUMBER! hours after receipt of an urgent service call received during normal working hours, and within !INSERT NUMBER! hours for urgent calls received after normal working hours, on weekends, or holidays. Once begun, the work shall be prosecuted to completion and must be completed within !INSERT NUMBER! hours.

(c) Routine Calls. All routine calls must be completed within !INSERT NUMBER! working days after receipt, and once begun, the work shall be prosecuted to completion. Routine calls shall normally be accomplished during normal work hours, Monday through Friday.

(2) Beyond the Scope of Urgent Call. If the Contractor responds to an urgent service call and believes the work required is beyond the scope of a service call, as defined above, the Government’s work reception center (during regular working hours) or !INSERT COMMAND DUTY OFFICER OR OTHER APPROPRIATE INDIVIDUAL! (after regular working hours) must be contacted within 60 minutes. If requested by the ACO, the Contractor shall provide a summary of the work needed and a detailed EPS estimate showing labor hour and material requirements within four hours of the request.

(a) If the ACO agrees the work required is beyond the scope of a service call, the scope of the work will be reduced and a new service call work authorization issued by the Government, or the original work authorization will be canceled. If the original work authorization is canceled the work will be accomplished in accordance with the "MINOR WORK" clause, Section C, or by means other than this contract.

(b) If the ACO determines that the work falls within the scope of a service call, the original work authorization will be returned to the Contractor, who shall complete the work. Payment deductions and liquidated damages will be taken if the work is not completed by the original time limit established when the call was received.

(3) Beyond the Scope of Routine Call. If the Contractor responds to a routine service call and believes that the work required is beyond the scope of a service call, as defined above, the work authorization form shall be returned to the work control center not later than !INSERT TIME! the following workday. The Contractor shall attach a summary of the work needed and a detailed EPS estimate showing labor hour and material requirements. The ACO may waive the requirement to submit estimates in cases where the scope of work is clearly beyond that of a service call.

(a) If the ACO agrees that the work required is beyond the scope of a service call, the scope of the work will be reduced and a new service call work authorization issued by the Government, or the original work authorization will be canceled. If the original work authorization is canceled, the work will be accomplished in accordance with the "MINOR WORK" clause, Section C, or by means other than this contract.

(b) If the ACO determines that the work falls within the scope of a service call, the original work authorization will be returned to the Contractor, who shall complete the work. Work on such calls must still be completed within !INSERT NUMBER! working days from the original receipt date/time, plus the amount of time the work authorization was held by the ACO for determination. Payment deductions and liquidated damages will be taken if the work is not completed within this time frame.

d. Completed Calls. Within one working day after completion of each service call, the Contractor shall add the following information to the work authorization form and return to the work reception center:

(1) Description of work actually completed.

(2) Brief description of material and parts used, including quantities.

(3) Date and time work began.

(4) Date and time work was completed.

(5) Hours of labor (by craft) expended.

(6) Signature or initials of the Contractor's craftsman performing the work (or supervisor), indicating that the work has been completed.

e. Materials and Equipment. The Contractor shall maintain sufficient off-the-shelf materials and equipment on hand to support service work requirements. Lack of availability of materials or equipment shall not relieve the Contractor from the requirement to complete service call work within the time limits specified above.

f. Historical Data. Data on the numbers and types of service calls of each classification that have historically been performed are included in Attachment J-C8.

!**********
NOTE TO SPECIFICATION WRITER: The $2,000 limit specified in the following clause assumes that Davis-Bacon wage provisions have not been included in the contract. See paragraph III.E of the User's Guide for a more detailed discussion regarding Davis-Bacon wage provisions and the $2,000 limit.
**********!

C.11 MINOR WORK. Minor work is defined as maintenance, repair, and alteration work requirements which are beyond the scope of service work (as defined in Clause C.10). The cost of any single instance of minor work is limited to a total cost (labor and material) of $2,000. All minor work is included in the indefinite quantity portion of the contract. The Contractor will be paid a negotiated fixed-price for each delivery order for minor work as specified in the following procedures. Material and equipment required for work based on the

Schedule of Indefinite Quantity Work - Unit Priced Labor, will be reimbursed in accordance with the "Establishing Total Material Costs" and "Estimating Total Equipment Costs" paragraphs below.

a. General Procedures. The Government will provide the Contractor a detailed scope of work developed according to the procedures specified in the "Preparation of Work Scopes for Minor Work" paragraph below for each proposed delivery order for minor work. The Contractor shall review the Government's scope of work and indicate specific areas of disagreement in accordance with the procedures specified in the "Contractor's Review of Proposed Work Scopes" paragraph below. After the ACO reviews the Contractor's proposed material/equipment unit prices and proposed scope changes, he/she will revise the Government's scope of work and/or negotiate any remaining areas of disagreement over work scope or material/equipment unit prices with the Contractor. The approved scope of work then becomes a fixed-price delivery order for the work described.

!**********
NOTE TO SPECIFICATION WRITER: If scopes of work will be developed on the Base Engineering Support, Technical (BEST) Facilities Engineering Job Estimating (FEJE) module, the following procedures may need to be altered slightly.
**********!

b. Preparation of Work Scopes for Minor Work. The Government's detailed scope of work will be provided on DD Form 2167, Job Phase Calculation Sheet, and will include: (1) the scope of work to be performed, (2) the number of hours set forth in the work performance standard to perform the given scope of work, (3) an identification of specific work tasks for which there are no applicable performance standards, and (4) the projected quantity of materials and equipment required to perform the required scope of work.

!**********
NOTE TO SPECIFICATION WRITER: EPS is used as the primary basis for determining the number of unit priced labor hours required to accomplish any given minor job. The user may choose to specify another primary source for labor hour standards, such as those published by R. S. Means Company, and modify the following clause accordingly.

Travel time is not included in the procedure for determining labor requirements described in the following paragraph, since it is assumed that no Government furnished facilities (which are located in EPS travel zone zero) are to be provided for the Contractor's use. If such facilities are to be provided, the user should consider deleting the words "travel (travel zone 0 (shop) will be used when applying total craft time to the EPS nomograph)" from the last sentence, and make other changes as appropriate to allow travel time to be included in the EPS determination of labor hour requirements.
**********!

(1) Labor Requirements. Engineered Performance Standards (EPS) shall be used as the primary source for determining the number of performance standard hours required to complete the scope of work. EPS does not cover every task that might be accomplished by specific crafts. For tasks not exactly identified in EPS manuals, work content comparison will be performed prior to a determination that EPS does not apply to a job. Work requirements that cannot be expressed either directly from EPS or using EPS work content comparison procedures will be determined based on the following commercial work performance

standards in the sequence indicated: *Means Repair & Remodeling Cost Data*, !INSERT OTHER APPLICABLE STANDARDS AS REQUIRED!. **No** standard labor hours will be included in the scope of work to allow for mark-ups or add-ons for travel [travel zone 0 (shop) will be used when applying the EPS nomograph], work time associated with union agreements, overhead, profit, material markups, supervision, or clerical support since these items were included in the labor hour unit prices and fixed burden rates bid.

(2) Material Requirements. Projected material requirements will include a list of materials establishing the size, quality, and number of units. Pre-expended bin supplies and materials will not be included in the list of materials since the cost for these items were included in the labor hour unit prices bid.

(3) Construction and Weight Handling Equipment Requirements. Requirements for construction and weight handling equipment will include identification of the type, size, capacities, and number of units; and whether or not Government furnished equipment and/or operators will be made available.

c. Contractor's Review of Proposed Work Scopes. The Contractor shall review proposed work scopes and provide: (1) proposed unit prices for the materials and equipment specified in the scope of work, (2) proposed number of standard hours required to complete the specified scope of work which are not covered by EPS or other specified work performance standards, (3) a description of any additional materials, equipment, or task descriptions that are necessary to satisfactorily accomplish the overall work scope for the particular craft phases, and (4) a list of any discrepancies in the material, equipment, and task descriptions listed in the Government's proposed scope of work. Descriptions of proposed additional materials, equipment, or task descriptions shall be prepared in accordance with the "Preparation of Work Scopes for Minor Work" paragraph, including appropriate performance standard task references and the total estimated number of performance standard hours. Reviewed work scopes shall be returned to the ACO within !INSERT! calendar days after receipt for proposed urgent minor delivery orders, and within !INSERT! calendar days after receipt of proposed routine minor delivery orders.

d. Establishing Final Cost for Minor Work. Once a bilateral agreement is reached, the final cost will be a firm fixed-price delivery order for the work described.

(1) Establishing Total Labor Costs. The total labor cost will be determined by totaling the number of performance standard labor hours for each craft (trade) and then multiplying by the appropriate labor hour unit price from the Schedule of Indefinite Quantity Work - Unit Priced Labor. This procedure will be followed for each craft required to perform the job. The total for all crafts is the total labor cost.

(2) Establishing Total Material Costs. Material prices provided by the Contractor shall be the lowest price available considering the availability of materials and the time constraints of the job. The direct material price shall be reduced by all discounts and rebates for core value or salvage value that accrue to the Contractor. The total direct material cost for the job will be multiplied by the Contractor's fixed burden rate from the "MATERIAL TO SUPPORT UNIT PRICED LABOR" contract line item, Section B, to determine the total burdened material cost for the job.

(3) Establishing Total Equipment Costs

(a) Rental equipment shall be based on the lowest price available considering availability and time constraints of the job.

(b) When the equipment to be used is owned by the Contractor, the price proposed shall be based on the U. S. Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8.

(c) Cost for equipment operators, when separate operators are required, shall be based on an EPS standard labor hour basis, unless operator cost is included in equipment rental price or operator has been provided by the Government. Any overhead expense associated with equipment usage shall be included in the Contractor's bid for the applicable labor hour unit price.

!**********
NOTE TO SPECIFICATION WRITER: The urgent and routine classifications allow for different completion times for minor work. The user should modify these requirements as needed.
**********!

e. Ordering Minor Work. The ACO will order minor work by issuing to the Contractor a copy of the approved summary of work scope and a delivery order for the work covered by the approved scope of work in accordance with the "ORDERING OF WORK" clause in Section G.

(1) Urgent Minor Work. The Government may classify up to !INSERT%! of the delivery orders for minor work as urgent. The Contractor shall complete all urgent minor delivery orders within !INSERT! calendar days of receipt. Urgent minor work shall normally be performed only during normal working hours, except that after hours and/or weekend work may be authorized by the ACO if required to complete work within the time requirement specified above.

(2) Routine Minor Work. All non-urgent minor work will be classified as routine minor work. Routine minor work will be further classified by the Government as one of two different "Types". Delivery orders for Type I routine minor work shall be completed within !INSERT! calendar days of receipt and Type II delivery orders within !INSERT! calendar days of receipt. No more than !INSERT%! of the delivery orders for routine minor work will be classified as Type I.

f. Engineered Performance Standards

(1) EPS Manuals. EPS manuals will be made available for examination at !INSERT LOCATION AT THE ACTIVITY WHERE THE WORK WILL BE PERFORMED AND THE CONTRACTS OFFICE AT WHICH THE BIDS WILL BE RECEIVED! and at Naval Facilities Engineering Command Engineering Field Divisions during the bidding period of this contract. !INSERT! copies of the EPS manuals will be provided to the successful bidder after award.

(2) Travel Zone Maps. The Travel Zone map for !ACTIVITY! is provided as Attachment J-C10 and is to be used in conjunction with the historical data in Attachment J-C8 to evaluate travel time impact.

!**********
NOTE TO SPECIFICATION WRITER: The user must insert dollar and time limits per

repair per PM inspection in the following paragraph. Remember that the intent of PM is to perform routine maintenance and to identify needed repairs, not to perform extensive repair work. Repairs should first be screened by the FMED then, if appropriate, performed by service call or minor job order. With this in mind, the PM repair limits set below should be based on the number, size, complexity, and condition of the equipment to be serviced. Suggested limits are one hour and $50.00.
**********!

C.12 PREVENTIVE MAINTENANCE INSPECTION AND SERVICE. The Contractor shall perform preventive maintenance (PM) inspection and services on the equipment and systems listed in Attachment J-C1 in accordance with the procedures specified in this clause and Attachment J-C11. PM consists primarily of inspection, cleaning, lubrication, adjustment, calibration, and minor part and component replacement (e.g. filters, belts, hoses, fluids, hardware, etc.) as required to minimize malfunction, breakdown, and deterioration of equipment; and the identification and performance of any repairs required to bring the equipment up to the manufacturer's operating standards, provided that such repairs can be made within !INSERT NUMBER! estimated direct labor hours or less and the total direct material cost does not exceed !INSERT DOLLAR VALUE! per PM inspection. PM shall be performed at least as frequently and shall, at a minimum, include all of the check points and services specified in Attachment J-C11. The Contractor may, at his/her option and at no additional cost to the Government, increase the level and/or frequency of PM in an effort to minimize repair requirements. The Government will provide the manufacturer's recommended PM schedule, as available, and other available manuals, pamphlets, etc. to the Contractor.

!**********
NOTE TO SPECIFICATION WRITER: From the PM frequencies specified in Attachment J-C11, the Contractor will normally be required to submit a detailed PM schedule for approval by the ACO. As an alternate, the user may want to require the Contractor to use a previously developed schedule which should be included in an attachment in Section J. Choose the OPTIONAL paragraph below in this case.

If the base period of the contract will be less than 12 months in length, the user must tailor the following paragraph and/or Attachment J-C11 so that it is clear what specific PMs will be performed during the base period. For example, indicate which annual PMs will be performed during the base period.
**********!

a. The Contractor shall submit a detailed PM schedule to the ACO for approval at least 15 calendar days prior to the start date of the contract. The schedule shall cover the entire term of the contract and shall include, for each specific piece of equipment listed in Attachment J-C1 and each PM inspection listed in Attachment J-C11, the location; the checks and services to be performed (e.g., monthly PM); and the week of the month that semi-monthly or less frequent PMs will be performed, and the day of the week that weekly or more frequent PMs will be performed. The schedule shall be in a format such that the completion of each PM inspection may be indicated on the schedule.

(1) Annual and semiannual PM inspections for HVAC equipment shall be scheduled to coincide with the periods immediately prior to the heating and cooling seasons. Heating season PMs shall be scheduled for performance during the period !INSERT DATE! to !INSERT DATE!. Cooling season PMs shall be scheduled for performance during the period !INSERT DATE! to !INSERT DATE!. PM

inspections for all other equipment may be scheduled at the Contractor's discretion unless specific requirements or restrictions are included elsewhere in the contract.

(2) Once the Contractor's PM schedule is approved by the ACO PM inspections shall be performed by the Contractor without further authorization by the ACO. The Contractor shall strictly adhere to the scheduled PM dates to facilitate Government verification of work. If the Contractor finds it necessary to reschedule PM, a written request shall be made to the ACO detailing the reasons for the proposed change at least five working days prior to the originally scheduled PM date. No scheduled PM dates shall be changed without the prior written approval of the ACO.

a. (OPTIONAL) The Contractor shall perform PM inspections in accordance with the schedule provided in Attachment J-C!INSERT!. The Contractor shall strictly adhere to the scheduled PM dates to facilitate Government verification of work. If the Contractor finds it necessary to reschedule PM, a written request shall be made to the ACO detailing the reasons for the proposed change at least five working days prior to the originally scheduled PM date. No scheduled PM dates shall be changed without the prior written approval of the ACO.

b. The Contractor shall submit a copy of the previous week's portion of the PM schedule to the ACO by !INSERT TIME! each Monday indicating the scheduled PM inspections completed during the previous week, and those scheduled inspections not completed. If inspections were performed which were deferred from previous weeks, they shall be noted on an attachment to the submittal. Also attached shall be:

!**********
NOTE TO SPECIFICATION WRITER: If equipment deficiencies are to be reported on a specific form, such as NAVFAC 11014/38, tailor the following paragraph accordingly and add a sample form to Attachment J-C5.
**********!

(1) A list of equipment deficiencies noted during the PM inspections which are beyond the scope of work of preventive maintenance, as defined above. These reports shall provide a detailed description of identified deficiencies. The ACO may issue a service call work authorization or delivery order for minor work, as appropriate, for correction of the deficiencies noted, the work may be performed by means other than this contract, or the work may be deferred due to lack of funds, etc. If at the time of the inspection, the Contractor feels it would be more economical to make such repairs while conducting the inspection, such as while a valve is open for cleaning and inspection, the Contractor may notify the ACO by phone of the defect and request a work authorization to make the repair at that time.

(2) All reports required as part of PM inspections in paragraph C.12.e below, or in Attachment J-C11. For example, paragraph C.12.e(3)(b) requires submittal of oil analysis reports.

!**********
NOTE TO SPECIFICATION WRITER: Tailor the following paragraph if facility history files are to be maintained by the Government.
**********!

c. The Contractor shall complete and maintain a Preventive Maintenance Inspection Record form for each item of equipment and system listed in Attachment J-C1. The completed forms shall be maintained by the Contractor in the facility history file throughout the term of the contract (see "Records and Reports" paragraph of the "MANAGEMENT" clause). A copy of the Preventive Maintenance Inspection Record form is included in Attachment J-C5.

d. To facilitate Government verification of PM inspections, the Contractor shall date stamp or mark all replacement items such as filters, belts, etc., with the date charged. Government furnished PM record cards or tags shall be attached by the Contractor, in a conspicuous location, to each item of equipment requiring PM during its initial inspection. The Contractor's mechanic shall initial and date these cards or tags upon completing each PM inspection, indicating that the scheduled PM has been completed.

e. The following general requirements are applicable to and amplify the specific PM inspection requirements contained in Attachment J-C11.

(1) Regular Adjustment. Regular adjustments as may be required for efficient, economical, and safe performance of equipment systems shall be made at the time of each scheduled preventive maintenance.

(2) Periodic Cleaning, Sanitation. Routine and scheduled cleaning of work areas and mechanical equipment rooms, systems, drains, drain piping, traps and pans, condenser coils, oil filters, applicable air filters, after coolers, cooling and/or heating coils, blower shields and fans, grills, registers, screens, diffusers, electrical contacts switch boxes, motors, gauges, strainers, dampers, actuators, louvers, safety controls, and any other applicable equipment, shall be accomplished as a part of the regular scheduled PM inspection and service, or more frequently as may be necessary to maintain a clean and sanitary operating condition.

(3) Lubrication, Oil

(a) Check applicable equipment for excessive bearing temperatures, noise, and inadequate lubrication of bearings and moving parts. Lubricate in accordance with manufacturer's instructions as to type of lubricant/oil and frequency of lubrication. Check oil level and oil quality and change dirty/contaminated oil. Make other adjustments to oil systems as required. Check oil temperatures and pressure.

(b) A laboratory oil analysis shall be conducted annually on all centrifugal chiller systems with capacities of 100 tons or greater. This test will check for acid, moisture, metals content, and other contaminants in accordance with the particular chiller manufacturer's requirements. The Contractor shall submit the name of the proposed testing laboratory not more than 30 days after the start date of the contract for the ACO's approval. Oil samples shall be drawn during the appropriate PM inspection, and copies of test results submitted with the weekly PM completion report not more than !INSERT NUMBER! weeks later.

(4) Replacement and Cleaning of Air Filters. Cleaning of air filters shall include a check for dust, grease, and other deposits and for missing or improperly fitted filters. Replace throw-away type filters and those missing or having improper fit; wash permanent type filters in soap suds or solvents, rinse

with hot water, and restore viscous coating in accordance with manufacturer's instructions.

(5) Rust and Corrosion. Clean rusted and corroded areas on equipment. Prime the cleaned surfaces and paint using a primer and paint suitable for the particular equipment and material surfaces being painted. Paint colors shall be matched as closely as possible to original or previous colors, or as otherwise approved by the ACO. Equipment identification data shall not be obscured or covered up with paint.

(6) Motors, Drives, Sheaves, Shafts, Couplings, Blowers, Fans, Hubs, Belts, Bearings, Gearboxes, Guards. Check for accumulations of dust, dirt, grease, and oil. Clean, adjust, service, repair, or replace items as necessary to correct existing deficiencies such as: worn, loose, missing, or damaged parts, guards, connections, and connectors; bent blades; worn, loose, broken or missing belts; unbalanced moving parts; shaft misalignment; worn or damaged couplings; excessive noises and vibrations; end play of shafts; bad bearings; ineffective isolators; vibration absorbers; etc. Check full load and run load amps of each electric motor, other than fractional H.P. and compare with manufacturer's data plate ratings. Check condition of motor windings and brushes.

(7) Wiring, Electrical Control Circuits, Systems. Check for loose, charred, broken, or damaged wires and insulation; short circuits, loose or weak contact springs; worn or pitted contacts; proper sizing of fuses; defective operation of parts and components; and other deficiencies. All wire splice connections shall be properly insulated. All electrical wiring, circuits, etc., shall be in accordance with the National Electrical Code for the particular application in which used. Clean, adjust, service, repair, or replace items found to be deficient.

(8) Fire and Safety Hazards. Check for dust, dirt, soot, oil and grease deposits and accumulations, drippings, presence of flammable materials, rags, debris, and any other conditions that may be construed to be a potential fire or safety hazard. Correct or remove from the site all fire and safety hazards.

(9) Thermostats, Subbases, Guards, Covers, Ambientstats, Sub & Master Controllers, Sensors, Transmitters, Temperature & Pressure Controls, etc. Check for improper settings, defective operation, calibration and cleanliness, proper control voltages, and pneumatic air operating pressures. Check for deficiencies in wiring, tubing, piping, switches, relays, coils, solenoids, transformers, controls, sensors, thermostats and protective covers and guards, ambienstats, acquastats, pressure switches, reversing relays, timing devices, master and sub-master controllers, outdoor authority override controllers, etc. Clean, adjust, service, repair, or replace items found to be deficient.

(10) Air Handler Units, Ducts, Plenums, Grilles, Registers, Diffusers, Screens, Dampers, Vanes, Mixing Boxes, VAV Boxes, Balancing of Air Systems. Check plenum chambers, supply and return air ducts, branch ducts, mixing boxes, VAV boxes, dampers, registers, grilles, diffusers, louvers, and insect and bird screens. Check for dirt, dust and trash; air leaks, broken, ripped or torn insulation and disconnected ducts; loose or broken connections, brackets, hangers, supports, and other parts; excessive vibrations or other movements; defects in metal, fiber glass, and other materials; proper operation of movable parts such as dampers, louvers, and vanes in relation to the controlling device;

and inadequate air flow and/or distribution in main and branch duct circuits. Check air handler unit systems for proper operation and correct CFM air flow. Balance air distribution systems to original design specifications for all areas being serviced by the systems. Check air temperatures and static pressures. Check turning vanes, fire dampers, access openings, doors, panels, outside air make-up systems, ducts, and screens. Clean by sweeping, brushing, dusting, vacuuming, washing, hosing with water, detergents, degreasers, solvents, chemicals, air pressure, steam, or other methods as are applicable to the nature of the item being cleaned, and as may be required to obtain desired results. Clean, adjust, service, repair or replace all items found to be deficient.

(11) Structures, Casings, Hangers, Supports, Beams, Platforms, Slabs, Pads, Vibration Absorbers, and Sound Isolators. Check mounting bolts; loose, broken, or missing parts, connections and hardware; improper level of equipment; and defective sound cushion isolators and vibration absorbers. Check for dirt, dust, trash, and other debris accumulated on or around the equipment. Check the security of all mounting and attaching points. Check for vibrations and other unusual movements. Clean, adjust, service, repair, or replace all items found to be deficient.

(12) Coils: Cooling/Heating, Condenser (Water and Refrigerant). Check for obstructions to air flow through all coils. Check for dust, dirt, and foreign materials accumulation, unusual noises and vibrations, and loose, missing or damaged parts. On direct expansion systems check for frosting or icing of coils; proper operation of expansion valves, capillary tubes and spider distributors; proper operation of automatic temperature controls and defrost timers; and check superheat across evaporator coils. Check all coils for leaks. On water cooling/heating coils check for proper water flow, temperature, and pressures across the coil. Clean and flush the water side of water cooling/heating coils (as applicable) as necessary to correct any deficiencies not allowing for proper operation. Check for damaged, bent or corroded coil fins on all coils. Clean, adjust, service, repair, or replace items found to be deficient.

(13) Condensate Drains, Pans, Piping, Traps. Check all condensate drain pans for algae growth and sedimentation, damaged coatings and insulation, rust corrosion, and leaks. Check condensate drain pipes and traps to assure they are open and water flow is not restricted. Clean, adjust, service, repair, or replace items found to be deficient.

(14) Piping: Water, Refrigerate, Oil, Air. Check for leaks, rust, corrosion, deformation, and material defects of all applicable piping and tubing. Check for piping and tubing vibrations, looseness, and rubbing against objects that can cause damage to the equipment; proper support for the piping and tubing; and vibraabsorbers, expansion joints and rupture discs. Piping, tubing, and fittings being replaced shall be compatible with existing materials. Clean, adjust, service, repair, or replace all items found to be deficient.

(15) Compressors. Check for dust, dirt, oil and grease deposits and accumulations, leakage of refrigerant and oil, cracked/clear sight glasses and gauges, damaged fittings, piping, valves, etc. Check for loose connections, excessive or unusual noise and vibrations; proper suction and discharge temperature and pressures, and indications of excessive heat. Check oil levels, unloaders for proper operation, and change out dirty/contaminated oil and filters. Check compressor full load and run load amps, compare against manufacturer’s data plate rating, and record the findings. Check all electrical

wiring and related components. Record the suction and discharge pressures and type and amount of refrigerant and/or oil added to the system, on the log sheet (as applicable) for air conditioning and compressed air plant compressors. Meg the motor windings on all compressor motors 15 H.P. and larger once each year and record the readings. Clean, adjust, service, repair, or replace all items found to be deficient.

(16) Air Cooled Condensers. Check for dust, dirt, foreign materials, oil and grease accumulations, leaks, excessive or unusual noise and vibrations; and loose, missing, or damaged parts. Check motors, sheaves, belts, bearings, shafts, supports, brackets, hardware, etc; check operation and calibration of fan cycling controls, low ambient switch controls and dampers, head pressure control louvers, actuators, and regulators, as applicable. Check for proper air flow through the condenser coil; and bent, damaged or corroded coil fins and fan blades. Remove weeds, bushes, and other obstructions within three feet of air cooled condensers. Clean, adjust, service, repair, or replace all items found to be deficient.

(17) Refrigerant & Oil Systems: Separators, Driers, Strainers, Filters, Oil Traps. Check for proper operation, refrigerant and oil leaks, and other material defects; check sight glass for clarity, cracks, or moisture. Check refrigerant and oil charges and levels. All systems with changeable core type filters/driers shall be changed as part of the regular PM inspection and service, or more often if required. Clean, adjust, service, repair, or replace all items found to be deficient.

(18) Pump Units. Check for dust, dirt, and other deposits; leaks; excessive or unusual noise and vibrations; and loose, broken, or missing parts and connections. Check for correct rotation and prime. Check seals, gaskets, packing, bearings, mounting bases and hardware, couplings, guards, and inlet and discharge pressures, and overall operations. Clean, adjust, service, repair, or replace all items found to be deficient.

(19) Tanks, After Coolers, Heat Exchangers, Heat Recoverers, Receivers, Accumulators. Check pressure tanks and other equipment items for damage and deterioration. Blow down or drain air tanks. Check all equipment items for leaks and missing or defective parts. Check pressure relief valves, check valves and regulators for proper operation. Check liquid levels, sight glasses, heat transfer, temperature differentials, and pressures as applicable.

(20) Balancing Chilled and Condenser Water Systems. Perform test of chilled and condenser water systems to assure these systems are providing the most efficient and economical operations attainable for that equipment and the facilities which it services. Check balance and rebalance if necessary to meet design specifications. Bleed air from chilled and condenser water loops as required to maintain efficient and standard operating conditions. Repair or replace automatic/manual bleed off valves in systems as required for proper operation.

(21) Insulation. Check for wet, damaged, missing, and deteriorated insulation and vapor barriers; broken tie wires, loose or missing binding bands, torn canvas jackets, etc. The insulation on all applicable system components shall be repaired or replaced as needed, with insulation materials having a vapor barrier and insulating value equal to or better than original or existing insulation materials. Insulated surfaces having moisture condensing on the

surfaces shall be considered inferior and shall be replaced. Clean, adjust, service, repair, or replace all items found to be deficient.

(22) Exhaust Air and Ventilating Systems. Check for dust, dirt, grease, and oil accumulations; air flow and weather and elements integrity; suction pressure at air intake; operation of dampers, baffles, solenoids, protective guards, insect and bird screens; and caulking around flashing, ducts, collectors, smokepipes, cowlings, hoods, caps, and covers. Clean or replace filters as applicable. Check for clogging, broken, or separated joints and seams in ducts, stacks, couplings, sheaves, belts, fan blades, blowers, etc. Check thermal insulation, protective coverings, vapor barriers, and loose or missing fasteners and hardware. Check for material defects and improper operation of moveable parts and components in relation to the controlling device. Check for loose, missing, or poor fitting flashing, fire and safety hazards, warning alarms, etc. Clean, adjust, service, repair, or replace all items found to be deficient.

(23) Valves: Hand, Check, Relief, Three-Way, Reversing, Float, Makeup, Bleedoff, Etc. Check applicable valves for operation, leakage, linkages, travel, range limitations, rust, dust, dirt, corrosion, scale, seizing, binding, mounting, clogging, broken, damaged or missing parts, and material defects. Check source of valve operation, i.e., pneumatic, electrical, pneumatic/electric, etc., for required pressures, electrical power voltages, etc. Clean, adjust, service, repair, or replace any parts, materials, components, or combinations thereof found to be deficient as a result of these inspections, to restore valves to a standard operating condition.

(24) Cabinets, Cases, Doors, Lids, Panels, Gaskets, Latches, Handles, Hinges, Hardware. Check for cracks, scrapes, gouges, separation, missing, broken or damaged parts and components, bad insulation, bad gaskets, leaks, fitting of doors, etc. Clean, adjust, service, repair, or replace all items found to be deficient.

(25) Cooling Towers. Check for external scale; leaks; defective valves and float assemblies; and deterioration and improper positioning of slats, baffles, and eliminators used to control water spray and/or distribution. See the "SPECIFIC REQUIREMENTS FOR COOLING TOWER SYSTEMS" clause, Section C for requirements for treatment of cooling tower water. Check for structural damage, rust, and corrosion. Check condition and operation of gearboxes (gear reducers), fans, blades and hubs, motors, drives, shafts, couplings, guards, bearings, etc. Check cooling tower water level, water make-up, drains, valves, overflow, and bleed-off. Clean, adjust, service, repair or replace all items found to be deficient.

C.13 EQUIPMENT OPERATIONS. The Contractor shall operate those HVAC, refrigeration, and compressed air systems indicated in the "OPS CHECK" column of Attachment J-C1. Operations shall be conducted in accordance with applicable manufacturer’s specifications, manuals, brochures, literature, directives, pamphlets, etc., except as may be directed by the ACO for reasons of emergencies, inclement weather, energy conservation, safety, etc. Operational checks shall be made daily not later than 9:00 A.M., at a minimum during all periods of equipment operation.

!**********

NOTE TO SPECIFICATION WRITER: As with PM inspections, the intent of operator maintenance is to identify and perform minor adjustments and repairs, not to

perform major repair work. With this in mind, the dollar and time limits below should be established based on the size, complexity, and condition of the equipment to be operated.
**********!

a. Operator Maintenance. Operator maintenance shall be performed daily, or more frequently if required by the equipment manufacturer. Operator maintenance shall include the performance of any needed minor adjustments and repairs, provided that such repairs can be made within !INSERT NUMBER! estimated direct labor hours or less and the total direct material cost does not exceed !INSERT DOLLAR VALUE!. Equipment deficiencies which are beyond the scope of operator maintenance shall be noted on Operational Log Sheets (See Attachment J-C5) and reported to the Government representative in writing not later than 9:00 A.M. the following work day.

b. Operation Log Sheets. Operation Log Sheets shall be filled out as part of each operational check. When systems are secured for extended periods for repair, seasonal shutdown, etc., a remark shall be included on the log sheet to that effect. Log sheets shall be subject to periodic inspection by the Government. Copies of all log sheets shall accompany the monthly payment invoice.

C.14 SPECIFIC REQUIREMENTS FOR AIR CONDITIONING EQUIPMENT. Air conditioning systems to be operated, maintained, and repaired are listed in Attachment J-C1. These systems vary in size from !INSERT! tons to !INSERT! tons. Maintenance, repair, and operation of these systems shall be performed in accordance with the recommendations of the manufacturer and the provisions of this contract, including the following:

!**********
NOTE TO SPECIFICATION WRITER: The start-up/shut-down requirements specified below are very general. It is important for the user to add detailed, specific requirements, such as manufacturers' recommended actions, to either this clause or to an attachment in Section J.
**********!

a. Seasonal Start-Up and Shut-Down

(1) The Contractor shall perform start-up/shut-down of those air conditioning systems listed in Attachment J-C12. The air conditioning systems listed are normally shut-down during the months of October or November, and started up during the months of April or May; however, the length of the season will vary and no adjustment in the contract price will be made regardless of the actual length of the season. The ACO will advise the Contractor of the specific date or dates when such services should begin to be accomplished. All work must be completed within !INSERT NUMBER! calendar days of the specified start date for equipment in individual buildings, or within !INSERT NUMBER! calendar days if services are ordered for all systems at the same time.

(2) During start-up, systems shall receive a thorough inspection to insure that all systems and components are operating as designed, as well as any specific checks and procedures which may be required by the manufacturer. Shut-down shall consist of system checks and preservation as required by the manufacturer, and an operational check to identify needed repairs that may be accomplished during the off season. Needed repairs which are within the scope of operator maintenance, as defined in paragraph C.13.a, shall be accomplished

by the Contractor as part of the start-up/shut-down. A report that work has been completed, including a list of needed repairs which are beyond the scope of Operator Maintenance, shall be provided to the ACO for each item of equipment within !INSERT NUMBER! working days after completion of the start-up or shut-down service.

b. Replacement of Burned Out Air Conditioning and Refrigeration Compressors. When compressors are replaced, the internal refrigeration system shall be thoroughly cleaned in accordance with the ACO approved manufacturer's procedures. Additional precautions shall be taken in accordance with approved and acceptable industry standards and practice to further control refrigerant system contamination and prevent damage to replacement compressors and components. Clean-up methods should include, but are not limited to, the use of clean up kits, suction and discharge line filters/driers, moisture indicating sight glasses, acid testing kits, changing or adding of oil filters and system flushing, changing the oil, deep vacuuming of refrigerant system, leak checking, etc., all as may be appropriate for the particular system.

!**********
NOTE TO SPECIFICATION WRITER: Delete the following clause if a portable chiller unit will not be maintained by the Contractor.
**********!

c. Portable Chiller System. The portable chiller system listed in Attachment J-C1 shall be set up, operated, and maintained by the Contractor to provide temporary cooling in those situations approved by the ACO. The system shall be maintained, repaired, and operated by the Contractor to the same extent as other equipment included in the contract, including PM inspections, start-up and shut-down service, and daily operational checks.

!**********
NOTE TO SPECIFICATION WRITER: Modify setup procedures as required to account for the availability of Government furnished transportation, if any.
**********!

(1) Setup Procedures. The portable system is mounted on a lowboy trailer, and when not in use is stored at !INSERT LOCATION, BUILDING NUMBER, ETC.!. The Government will provide equipment and labor as required to transport the system to the needed location and back to storage. When the system is needed by the Contractor and is available, the Contractor shall notify the ACO as far in advance as possible, but not less than !INSERT TIME! days in advance in the case of routine requirements and not less than !INSERT TIME! hours in the case emergency or urgent requirements. The Contractor shall acquire and maintain all hoses, connections, flanges, couplings, hardware, and other components needed; and all labor as required for setting up and connecting the system to the fixed piping system of the chiller and facility being served.

(2) System Requirements

(a) If needed to provide temporary cooling during periods when repairs are being performed by the Contractor, chiller installation, operation, and maintenance shall be performed as part of the service call or minor job order, as appropriate.

(b) If directed by the ACO the unit shall be installed, operated, and maintained by the Contractor to support functions not associated with this

contract, e.g., to provide cooling during an equipment overhaul being performed by another Contractor. Installation, operation, and maintenance services shall be provided under the service call or minor work provisions of the contract, as appropriate.

d. Condensate Piping and Lines. Condensate drain pans, piping and lines, insulation materials, valves, traps, brackets, supports, flanges, hardware, and other related components shall be maintained from the equipment to the point where the water discharges into the floor drain or other connecting drain system, or to that point where the drain piping or line begins passage through the wall or floor.

e. Two Pipe Cooling/Heating Water Distribution Systems. All equipment components, pumps, motors, valves, water coils, controls, etc., associated with two pipe water distribution systems shall be maintained and repaired.

f. Window and Through-the-Wall Type Air Conditioning Units. Window and through-the-wall units include straight cooling types, cooling/heating reverse cycle types, types with electrical resistance strip heat as primary heat source, and cool/heat reverse cycle units with supplemental electrical resistance strip heat. Maintenance and repair of these units includes cabinets, casings, openings, carpentry trim work, caulking, insulation, brackets, supports, painting, and other work normally associated with this type of equipment. When window or through-the-wall type units are removed for servicing, the opening shall be covered with a weather and element resistant material in such a way as to prevent the entrance of water, dust, and insects into the facility from which the unit was removed.

g. "On/Off" Time Clocks. The buildings listed in Attachment J-C13 have "on/off" time clocks that turn air conditioning units and/or air handling equipment on and off at pre-selected times of the day and days of the week. Times and dates shown on the list have been established as appropriate operating guidelines by the ACO and are subject to change. These time clock operating guidelines, and any subsequent changes thereto, shall be adhered to by the Contractor at no additional cost to the Government unless such changes result in an increase or decrease in contract requirements, at which time the contract price will be adjusted in accordance with the "CHANGES" clause of Section I.

(1) Time Clock Adjustment. The Contractor shall maintain and repair time clocks, and make ongoing adjustments to ensure accurate time of day and day of week settings to comply with the established list. Some adjustments may be necessary to compensate for temporary electrical power outages, etc., (some time clocks will not be affected by such temporary power outages).

(2) Prohibited Time Clock Adjustments. "On/off" time clock adjustments to a time of day and/or day of week setting different from the approved settings shall not be made without prior approval of the ACO. Changes to time settings for customer or Contractor convenience shall not be made without ACO approval.

h. Filter Maintenance. The filters listed in Attachment J-C14 shall be changed or cleaned at the frequencies specified. The Contractor shall submit a detailed filter maintenance schedule to the ACO for approval at least 15 calendar days prior to the start of the contract. The schedule shall cover the entire period of the contract and shall indicate the week of the month that filters are to be changed/cleaned for each building listed in the attachment.

i. Standby Air Compressor. The Contractor shall have available at least one portable compressed air system suitable for backup (standby) service for air conditioning and heating equipment systems pneumatic controls, at no additional cost to the Government. This compressor must be available for use within the response time limit specified for an emergency service call.

C.15 SPECIFIC REQUIREMENTS FOR COOLING TOWER SYSTEMS. The Contractor shall furnish services for the maintenance and repair of cooling tower systems, and for the treatment of cooling tower circulating water. Services shall consist of, but not be limited to, development of a treatment program for each cooling tower; installation of monitoring and treatment equipment; flushing and cleaning of cooling towers; and testing and treatment of circulating water to prevent accumulation by precipitation of scale, corrosion, biological growths, and other foreign materials. Attachment J-C15 provides a list of the cooling towers requiring service.

a. Treatment Program. The Contractor shall provide a circulating water treatment program for each cooling tower listed in Attachment J-C15 in accordance with the following requirements. After approval the program will be continuously monitored and modified by the Contractor as required to meet the treatment standards specified. All proposed changes to the approved program shall be submitted in advance for the ACO's approval.

(1) Proposed Treatment Program. An outline of proposed chemical treatment procedures shall be provided for the ACO's approval at least 15 calendar days prior to the start date of the contract. The proposed procedures shall comply with the requirements specified in paragraph C.15.a(2) below, and shall include:

(a) The amount, type, and methods of feeding and controlling of chemicals to be used. Where applicable, include chemical active ingredient levels in parts per million (ppm).

(b) Shop drawings showing the proposed installation of chemical feed equipment and coupons required for corrosion testing.

(c) Proposed limits for pH, total dissolved solids, corrosion inhibitor, scale inhibitor, and biocide. The concentration ratio to be used as the operating base, as discussed in paragraph C.15.a(2)(e), shall also be provided.

(d) Proposed chemical shipping, handling, and storage procedures. Include specimen label, product registration number, and application instructions for all proposed algaecides.

(e) Proposed record keeping forms and procedures.

(f) Proposed circulating water, makeup water, and scale and corrosion testing procedures.

(g) Name, address, background, and other pertinent information on proposed independent testing laboratory.

(2) Treatment and Control Requirements. The Contractor's cooling tower water treatment program shall be designed to minimize corrosion, scale, deposition, and microbiological activity, and shall be effective over the entire

expected temperature range. All chemicals shall be commercially available for use in the treatment of cooling tower water. All chemical additions and treatment methods shall comply with the latest Environmental Protection Agency requirements and recommendations, and bleedoff water and other discharges shall be maintained in compliance with all applicable federal, state, and local laws and regulations. Chromates and other chemicals which are considered potential pollutants shall not be used.

(a) Corrosion Control

1 Mild steel corrosion rates shall be maintained below 2.5 mils per year (mpy) at all times.

2 Copper and cupro nickel corrosion rates shall be below 0.3 mpy at all times.

3 Chromium is banned by the Navy for use in cooling tower water treatment and shall not be used.

(b) Scale Control. Sufficient scale inhibitor/polymer shall be applied to prevent any calcium carbonate or calcium sulfate scale. Control limits for pH shall be designed to prevent such scaling. No acid will be used.

(c) Deposit Control. Specific deposit control agents shall be applied to prevent and minimize suspended solids deposition within exchangers.

(d) Microbiological Control

1 Bacterial testing shall be performed to determine bacterial levels in the cooling tower. Test results shall be used to indicate when the biocide treatment should be changed or altered. Historical data on results shall be maintained to determine the most effective treatment.

2 Algae growth shall be minimized and no heavy accumulations of algae shall exist in the system.

3 The total lethal dosage rate of biocide used shall never drop below a 25% level.

4 No deterioration of wood components shall occur as a result of the treatment program.

5 Algaecides used shall be registered with the Environmental Protection Agency under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136 (et seq.)) specifically for use in cooling towers. The algaecide shall be used in strict conformance with label instructions.

(e) Cycles of Concentration. The dissolved solids concentration in the circulating water shall be controlled within the range of accepted chemical treatment practice and such that the treatment program provided will positively prevent scale and corrosion. The Contractor shall calculate a concentration ratio as the operating base and shall consistently control the concentration ratio of the circulating water within plus or minus one of the operating base. The operating base shall be calculated with regard to the makeup water quality and the maximum concentrations of mineral solids (silica, hardness, and alkalinity) allowable under the chemical treatment program.

(f) Cleaning and Flushing. All cooling towers shall be cleaned and flushed of scale, trash, mud, dirt, algae, slime, and other foreign material within 15 calendar days after the start date of the contract, and prior to implementation of the Contractor's approved water treatment program. Additional flushings and cleanings shall be performed as necessary to remove excess accumulations of such foreign material.

b. Test Requirements

(1) Circulating Water Testing. Circulating water from each cooling tower shall be tested weekly for pH; conductivity; scale and corrosion inhibitor levels; biocide; and bacterial levels. Cycles of concentrations shall be calculated weekly using chlorides. Where applicable, tests shall be conducted in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*. Test results shall be submitted with each monthly invoice.

(2) Makeup Water Testing. Makeup water comes from the activity's potable water source. The Contractor shall obtain an analysis of this water annually in the month of December to check constituent variability, and adjust chemical treatment procedures as required with respect to pH, color, turbidity, P alkalinity, MO alkalinity, total hardness, non carbonate hardness, carbonate hardness, total dissolved solids, specific conductance, calcium, magnesium, sodium, potassium, hydroxide, bicarbonate, carbonate, sulfate, chloride, nitrate, iron, manganese, silica, fluoride, and chlorine residual. Tests shall be conducted in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*. Test results shall be provided to the ACO within !INSERT NUMBER! working days after sampling.

(3) Scale and Corrosion Tests. The Contractor shall provide for accurate measurement of corrosion consistent with ASTM D2688 (Coupon Test Method) or the corrosion test method described by the National Association of Corrosion Engineers (NACE). As a minimum the Contractor shall furnish and install mild steel and copper corrosion coupons in each metal cooling tower system as depicted in the latest edition of ASTM D2688, Method B, "Standard Methods of Test for Corrosivity of Water in the Absence of Heat Transfer, Coupon Test". Coupons shall be installed at the beginning of the contract and replaced every 90 days. Coupon holders shall be repaired or replaced as required to maintain in compliance with ASTM or NACE standards. Identifying marks shall be placed on each coupon and complete records shall be kept of installation and removal dates, locations, initial weight, final weight, length, width, thickness, amount of fouling, and exposure time. Scale and corrosion tests shall be conducted by the approved independent testing laboratory in accordance with ASTM D2688, and results provided to the ACO within !INSERT NUMBER! working days of each coupon's replacement. Reports shall include a scale analysis or corrosion rate in mils per year, and a written description based on ASTM D2688.

c. Equipment Requirements. All equipment used in the approved treatment program shall be furnished and installed by the Contractor, and shall comply with the following:

(1) Automatic Bleedoff and Chemical Feed Control. Automatic bleedoff and chemical feed controls shall consist of a conductivity meter which controls both the bleedoff and chemical feed of the cooling tower system. Automatic bleedoff controls shall monitor the circulating water and regulate bleedoff

water to maintain the proper concentration. The chemical feed shall be properly controlled so that the proper amount of chemicals are automatically fed to replace those lost through bleedoff.

(2) Pumps. Pumps shall have a capacity which is compatible with the chemical feed requirements of the individual cooling tower system served. Pump operation shall be controlled by an automatic adjustment which will proportion the chemical feed at a step rate in accordance with the bleedoff rate. In addition, a manual switch shall be provided to allow control of the pump independently of the feeding regulator. Manual adjustments necessary to accomplish capacity control shall be simple and positive. The pump shall be of noncorrosive construction and shall have an internal checking device or shall be provided with an externally mounted noncorrosive check valve. The pump shall be capable of discharging against a pressure of not less than 1 1/2 times the line pressure at the point of connection.

(3) Chemical Solution Tank. Chemical solution tanks shall be constructed of noncorrosive material, and have a sufficient capacity to require recharging only once per seven days during normal operation. The charging concentration chosen shall be such as to prevent deterioration of the chemical solution during the seven day period and prevent concentration of ingredients in the chemical solution. The tank shall be provided with a valved cold water line and, if necessary, a valved hot water fill line. Both shall have a suitable air gap. The tank shall have a graduated sight glass or have other suitable device to indicate the quantity of solution in the tank. In addition, the tank shall be equipped with a suitable removable perforated noncorrosive basket for dissolving chemicals in the tank. A suitable electric mixing device shall be provided with the tank.

d. Maintenance and Repair. Cooling tower structures and all components thereof shall be maintained and repaired, including all motors, fans, gearboxes (gear reducers), and hubs; drives, shafts, couplings, sheaves, belts, and guards; float assemblies and valves; drain lines, piping, and valves from the cooling tower pan (basin) to the point at which water is discharged into the sewer or storm drain system, including all supports, brackets, flanges, and hardware to maintain the piping; bleed off systems; and make up water piping and valves (from the valve itself into the cooling towers and systems.

C.16 CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS. Attachment J-C16 provides a list of facilities containing chilled water systems that have an established chemical treatment program. The Contractor shall continue the existing treatment program for the first 90 days of the contract term, then, every 90 days thereafter, provide an inspection check and subsequent adjustments in chemicals to maintain pH limits of 7.0 to 10.0, and nitrite levels of 500 to 1,000 ppm as $N0_2$. Inspection checks and any required adjustments shall be made at 90 day intervals throughout the term of the contract. The Contractor shall maintain detailed records of the results of all inspection checks and chemical treatments to include: building number and system, date chemicals were applied, description of chemicals used, quantity of chemicals used per system to maintain standards, chemical level readings in system before and after adjustments, date of inspection check and adjustment, and name of person(s) performing the inspections and/or adjustments. This information shall be provided to the ACO in writing within five working days of each inspection check.

C.17 SPECIFIC REQUIREMENTS FOR COMPRESSED AIR SYSTEMS AND COMPONENTS. Compressed air systems required to be maintained and repaired are listed in

Attachment J-C1. These systems vary in size from fractional horsepower units up to !INSERT! horsepower, and pressure ranges up to !INSERT! PSI. Maintenance and repair of these systems shall be performed in accordance with the recommendations of the manufacturer and the provisions of this contract, including the following:

a. Maintenance and Repair

(1) Air Compressors. All components, including electrical or internal combustion drive engines, damaged or worn pistons, cylinder walls, heads, etc. shall be maintained and repaired.

(2) Auxiliary Equipment. Auxiliary equipment, including air intake filters, silencers, electrical motors, generators, air controls, intercoolers and aftercoolers, separators, traps, air receivers (unfired pressure vessels), air dryers, and other associated components shall be maintained and repaired. Any component disassembled for repair shall be thoroughly cleaned and inspected for leaky, worn-out, corroded, and damaged gaskets, air filters, relief valves and seats, tube sheets, baffles, floats or buckets, etc., and appropriate repairs made.

(3) Pressure Regulating Valves. Worn, damaged and leaky stems, disks, seals, and gaskets shall be repaired or replaced as required. Any valve disassembled for repair shall be thoroughly inspected for signs of worn or damaged packing and broken, bent, and corroded or missing parts; the bonnet cleaned; the stem lubricated; and the system pressure tested after reassembly to ensure that all joints are sealed.

(4) Other Miscellaneous Components. Damaged, bent, deteriorated, and leaky drains and compressed air piping shall be repaired or replaced. Damaged, worn, or corroded pressure indicators and gauges shall be repaired or replaced. All other compressed air system related components, whether specifically addressed or not, shall be maintained and repaired.

b. Certification of Unfired Pressure Vessels (Air Receivers). The Contractor shall provide all material and labor necessary to prepare unfired pressure vessels for inspection in accordance with the *National Board of Boiler and Pressure Vessel Inspectors Code*. There will be approximately !INSERT NUMBER! certifications required per year. The ACO will normally provide the Contractor at least !INSERT NUMBER! days notice of each inspection. Inspections will be performed by a Government furnished inspector in accordance with NAVFAC MO-324, *Inspection and Certification of Boilers and Unfired Pressure Vessels*. All deficiencies identified by the inspector shall be corrected under the service call or minor work provisions of the contract, as appropriate, and in accordance with the requirements of the NAVFAC MO-324.

C.18 SPECIFIC REQUIREMENTS FOR REFRIGERATION UNITS AND SYSTEMS. The refrigeration units and systems to be maintained and repaired are listed in Attachment J-C1. These systems include cold storage plants with freezer and refrigerated walk-in rooms, walk-in freezer and refrigerated boxes; reach-in freezer and refrigerated boxes; refrigerated display cases, salad bars, sandwich bars, food bars, beer coolers, beverage coolers and dispensers, milk storage and dispensing units, ice cream freezer units, ice making equipment, medical and immunization supplies refrigeration units, blood bank freezers and refrigeration units; and various other miscellaneous equipment. Maintenance and repair of these systems shall be performed in accordance with the recommendations of, and

as to meet the rated temperature ranges specified by, the manufacturer and the provisions of this contract.

C.19 MISCELLANEOUS EQUIPMENT AND SYSTEMS. Miscellaneous equipment and systems listed in Attachment J-C1 shall be maintained and repaired in accordance with the recommendations of the manufacturer and the provisions of this contract, including the following:

a. Ventilating Equipment and Systems. The Contractor shall maintain and repair ventilating equipment consisting of ventilating, exhaust, and utility fans, and those systems associated with the operation of these items of equipment.

b. Peripheral Systems. The Contractor shall maintain and repair peripheral systems associated with the equipment included in Attachment J-C1, including the following:

(1) Pneumatic and/or electrical/electronic controls shall be maintained and repaired, including air compressors and all related components; air driers, refrigeration and/or chilled water systems; and timing devices, switches, microprocessors, transformers, relays, sensors, gauges, thermometers, thermostats, subbases, covers, guards, sending units, dampers, wiring, tubing actuators, valves, fittings, piping, regulators, master and submaster controllers, etc., normally associated with the contracted equipment.

(2) All electrical wiring and conduit from the load side of the equipment starter; the equipment starter; the respective electrical drive motor for all equipment with remote magnetic starters, contacts, relays, etc.

(3) All refrigeration and oil systems piping and components thereof.

(4) All insulation of refrigeration and oil piping, chilled water piping, and other piping associated with equipment.

(5) All motors, starters, heaters, contacts, relays, fuses, timing devices, switches, transformers, wiring, etc., not specifically included elsewhere in the contract.

(6) Condenser water and chilled water circulating pumps, motors, starters, contacts, relays, switches, fuses, wiring, heaters, base mounts, shafts, couplings, drives, guards, valves, seals, gaskets, rupture discs, pressure gauges, strainers, filters, thermometers, and piping between pumps and equipment, etc.

(7) Chilled water make-up system to include all piping, valves, filters, strainers, expansion tanks, and other related components thereof that are down stream from the make-up water regulating valve and/or manual by-pass valves, and to that point where the make-up water enters the chilled water system.

(8) On systems that have a magnetic starter, contact, or relay as an integral part of the unit, the Contractor shall maintain the wiring and conduit in between, up to the load side of the disconnect switch and/or circuit breaker, whichever is nearest to the unit. On systems without magnetic starters, contacts, relays, etc., (such as exhaust fans), the Contractor shall maintain

the wiring and conduit in between, up to the load side of the disconnect switch, on/off switch, and/or circuit breaker, whichever is nearest to the unit.

(9) All incidental materials, hardware panels, boxes, brackets, supports, weatherstripping, caulking, sealing, flashing, connections, etc., as required.

(10) Any other equipment, systems, components, and parts relative to the maintenance, repair, and operation of equipment not specifically covered elsewhere in this contract, unless specifically excluded.

c. Dehumidification Units and Systems. Dehumidification units shall be maintained and repaired to the recommended standards of the manufacturer and in accordance with the provisions of this contract.

d. Vacuum Pump Units and Systems. Vacuum pump units and systems shall be maintained and repaired in accordance with the manufacturer’s manuals and procedures and the provisions of this contract.

e. Water Coolers. Water coolers shall be maintained and repaired in accordance with the recommended standards of the manufacturer and in accordance with the provisions of this contract. Water temperatures shall be maintained within design specifications and coolers well adjusted to provide for a suitable and adequate water flow when dispensing. Systems include supply water piping, filters, screens, strainers, and valves from the supply water shut-off valve to the unit; and drain water piping and traps from the unit to the point where water discharges into the floor drain or other drain system, or to that point where the drain piping passes through a wall or floor.

END OF SECTION C

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J: LIST OF ATTACHMENTS

!**********
NOTE TO SPECIFICATION WRITER: The numbering system used below is designed so that the number of the Attachment refers back to the Section that it supports. Attachment J-C1 supports Section C and is the first Attachment referenced in that Section. The user should include those Attachments marked "*", as required.
**********!

TABLE OF CONTENTS

ATTACHMENT J-1

DEPARTMENT OF LABOR WAGE DETERMINATION

!**********
NOTE TO SPECIFICATION WRITER: Choose one of the following.
**********!

Attached is Wage Determination !INSERT NUMBER!. This determination specifies the minimum wages and fringe benefits to be paid under this contract.

!OR!

A wage determination has been requested from the Department of Labor and will be incorporated by amendment upon receipt.

ATTACHMENT J-C1

INVENTORY OF EQUIPMENT AND SYSTEMS

!**
NOTE TO SPECIFICATION WRITER: The importance of providing a complete and accurate inventory of equipment and systems cannot be overemphasized.
**!

This attachment includes a list and description of the equipment and systems to be maintained, repaired, and operated, as specified in Section C.

BUILDING NUMBER	EQUIPMENT DESCRIPTION	TONNAGE/ HP	QTY	MODEL NUMBER	MANUFACTURER	PM CHECK NUMBER	OPS CHECK
102	Air conditioning split/ central system, complete	20 Ton	1	2FSD68	Trane	4	NO
128	Chiller, water (reciprocating) system, complete	90 Ton	1	VRB0803B	Bohn	2	YES
	Compressed air plant, low pressure, complete	20 HP	2	30TPT2F20	Ingersol-Rand	6	NO
138	Chiller, water (centrifugal) system, complete	163 Ton	1	HTB2	York	1	YES
148	Freezer, walk-in	30 HP	2	2B518X	Trane	7	NO
	Refrigerator, walk-in	20 HP	1	3F5B40-N	Trane	7	NO
212	Cooling Tower	15 Ton	1	33-20MH1609	Havens	11	NO
307	Air Handler	20 HP	1	CL602513	York	14	NO
417	Chiller, water (screw machine) system, complete	150 Ton	1	PSC-150-0	Dunham-Bush	1	YES
526	Portable chiller (centrifugal) system	100 Ton	1	HTBl	York	1	YES
532	Heat pump	5 Ton	1	APCOTS	Carrier	15	NO
612	Heat pump (window unit)	2 Ton	3	5KH35N2 5KU47N2 5GH3lN2	General Electric	15	NO
703	Ventilator	10 HP	1	P/N 365M	Penn	17	NO
737	Chiller, water (absorption) system	225 Ton	1	ER83	York	18	YES
810	Evaporative cooling system	25 Ton	1	FUR27N	Air Fan	20	NO

!ETC!

ATTACHMENT J-C2

GOVERNMENT FURNISHED FACILITIES

!**********
NOTE TO SPECIFICATION WRITER: List all facilities that are to be provided to the Contractor. Provide descriptive characteristics and provide simple drawings of each facility showing Contractor areas, areas retained for use by the Government, etc.
**********!

The following facilities will be made available for use by the Contractor, as specified in the "GOVERNMENT FURNISHED PROPERTY AND SERVICES" clause, Section C.

BUILDING NUMBER/LOCATION	DESCRIPTION	SQUARE FOOTAGE
5/Naval Station	Office Space (2)	600 SF
	Lounge Area (1)	350 SF
	Rest Rooms (2)	400 SF
	Maintenance Shop (1)	1,000 SF
	Hallways, stairs etc.	150 SF
	TOTAL INTERIOR =	2,500 SF

!ETC!

ATTACHMENT J-C3

GOVERNMENT FURNISHED EQUIPMENT

!**********
NOTE TO SPECIFICATION WRITER: List all equipment that will be provided to the Contractor. Provide descriptive characteristics including manufacturer, model type, age, condition, etc.
**********!

The following items of equipment will be made available for use by the Contractor, as specified in the "GOVERNMENT FURNISHED PROPERTY AND SERVICES" clause, Section C.

ITEM	MODEL NO.	BRAND NAME	AGE	LOCATION
10" Grinder	011702	Schaver	15 yrs	Bldg 5
		!ETC!		

ATTACHMENT J-C4

GOVERNMENT FURNISHED MATERIAL

!**********
NOTE TO SPECIFICATION WRITER: List all materials that are to be provided to the Contractor. Provide descriptive characteristics including generic name, federal or commercial specifications, and quantities of issue. Indicate how it is to be provided to the Contractor, i.e., does he/she pick it up (where and when) or will the Government deliver it?
**********!

The following material will be made available for use by the Contractor, as specified in the "GOVERNMENT FURNISHED PROPERTY AND SERVICES" clause, Section C.

PART A - ONE TIME ISSUE

DESCRIPTION	QUANTITY

PART B - INSURANCE ITEMS

DESCRIPTION	MINIMUM QUANTITY

ATTACHMENT J-C5

LIST OF REQUIRED RECORDS AND REPORTS

!**
NOTE TO SPECIFICATION WRITER: The format, frequency, and specific data to be recorded and reported by the Contractor should be tailored by the user to obtain pertinent information for the equipment, and enable the activity to periodically monitor the Contractor's operations and complete and prepare required reports. Keep in mind numerous reports and high frequency requirements cost more money. Reports should be minimized and formats designed to consolidate and provide the necessary information with minimal effort. Attach example forms (such as the example log sheet provided), report formats, etc., so the Contractor can get an accurate picture of the effort required in preparation.
**!

The following records and reports shall be prepared, maintained, and submitted by the Contractor as specified in the "MANAGEMENT" clause, Section C.

RECORDS (CONTRACTOR RESPONSIBILITY)

	SPECIFICATION REFERENCE	RECORD TITLE	WHEN SUBMITTED	SAMPLE ATTACHED
a.	C.7.c(1)	Facility History Files	Contract Completion	No
b.	C.12.c	Preventive Maintenance Inspection Record	Contract Completion	Yes
c.	C.9.f	As-Built Drawings	Within !INSERT! Days of Work Completion	No
d.	C.13.b	Operation Log Sheets	With Monthly Invoice	Yes

REPORTS (CONTRACTOR RESPONSIBILITY)

	SPECIFICATION REFERENCE	RECORD TITLE	WHEN SUBMITTED	SAMPLE ATTACHED
a.	C.7.c(2)	Cost Accounting Report	With Monthly Invoice	Yes
b.	C.12.b	Preventive Maintenance Completion Report	By !INSERT TIME! each Monday	No
c.	C.14.a(2)	Start-up/Shut-down Deficiency Report	Within !INSERT! working days after completion of shut-up/shut-down	No
d.	C.15.b(1)	Cooling Tower Circulating Water Test Results	With Monthly Invoice	No
e.	C.15.b(2)	Cooling Tower Makeup Water Test Results	Within !INSERT! working days after sampling date	No

	SPECIFICATION REFERENCE	RECORD TITLE	WHEN SUBMITTED	SAMPLE ATTACHED
f.	C.15.b(3)	Cooling Tower Scale and Corrosion Tests	Within !INSERT! working days after coupon replacement	No
g.	C.16	Chilled Water Systems Chemical Treatment Inspection	Within five working days of inspection check	No

CENTRIFUGAL CHILLER LOG SHEET

DATE/ TIME	COOLER					CONDENSER				COMPRESSOR						GEAR OIL		OPERATOR'S INITIALS	REMARKS
	REFRIGERANT			WATER TEMP		REFRIGERANT		WATER TEMP		DAMPER POSITION	BEARING TEMP		RESERVE TEMP	PRESSURE		PRESS	TEMP		
	PRESS	TEMP	SHUT-DOWN LEVEL	IN	OUT	PRESS	TEMP	IN	OUT		THRUST END	SEAL END		SUPPLY	SEAL HSNG				

ATTACHMENT J-C6

REFERENCE DRAWINGS

!**********
NOTE TO SPECIFICATION WRITER: Supply a list of drawings that will be made available to the Contractor.
**********!

The following drawings will be made available for the Contractor's information, as specified in the "GENERAL REQUIREMENTS AND PROCEDURES" clause, Section C.

NAVFAC DRAWING NUMBER	BUILDING	TITLE
510336	552	HVAC Equipment Schedules, Legend
5147248	603	HVAC Equipment Schedules, Legend
5109205	721	HVAC Key Plan
5109212	721	HVAC Mechanical Room Plan
5109213	721	HVAC Detail

!ETC!

ATTACHMENT J-C7

CRITICAL EQUIPMENT AND SYSTEMS

!**
NOTE TO SPECIFICATION WRITER: The purpose of this Attachment is to provide a list of HVAC equipment whose continued operation is very important. Such equipment could be providing climate control in spaces containing computer equipment or electronic controls, commissary meat lockers, etc. Ensure that only truly critical equipment is included in this list.
**!

This attachment provides a listing of critical equipment and systems. Service calls on critical equipment will normally be classified as emergency calls, as specified in paragraph C.10.b(1).

BUILDING NUMBER	EQUIPMENT DESCRIPTION	FACILITY DESCRIPTION
128	Chilled Water System	Naval Dental Clinic
216	Refrigeration System	Galley
304	Packaged Air Conditioning System	SSC Computer Room
500	Chilled Water System	Naval Hospital
557	Chilled Water System	NTEC Computer Building
603	Refrigeration Systems	Maxi Mart
711	Heat Pump	Child Care Center
735	Chilled Water System	Classroom Building
777	Walk in Refrigerator	Package Store
821	Refrigeration Systems	Commissary
871	Heat Pump	Chapel
942	Heat Pump	Nursery

ATTACHMENT J-C8

HISTORICAL DATA

!**********
NOTE TO SPECIFICATION WRITER: This attachment includes example formats for displaying historical data. Accurate and complete historical data is essential in the development of realistic Contractor bids. If complete information is not available, projections should be made based on the data that is available, and some system established to capture required historical information for future contracts. When determining the number of calls of each classification be sure to consider the tailored service call classification definitions in Section C, clause C.10, especially if definitions have been changed from previous contracts. If a CA program study is being conducted, data should be based on estimated versus actual hours so that the Government's most efficient organization will not be compromised.
**********!

The data in this attachment is taken from the activity's records for the buildings and structures to be maintained under this contract. It is not considered sufficiently accurate for bidding purposes by itself, but is included to indicate the types, approximate order of magnitude, and seasonal trends in the workload.

SERVICE CALL WORK

NUMBER OF SERVICE CALLS PER MONTH

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Emergency												
1989	4	4	6	18	21	17	12	13	7	8	6	5
1990	5	8	7	22	20	21	14	12	8	8	5	4
Urgent												
1989	13	13	16	40	57	44	33	31	27	21	21	14
1990	15	13	16	45	61	53	37	41	30	23	19	17
Routine												
1989	32	24	29	78	111	89	71	72	55	43	38	30
1990	37	27	30	77	121	104	77	79	61	42	37	28
TOTAL												
1989	49	41	51	136	189	150	116	116	89	72	65	49
1990	57	48	53	144	202	178	128	132	99	73	61	49

The various trades listed below were used in performing the service calls shown in the chart above. The percentage of the total number of service calls shown in which each trade was involved are also shown below. For example, electricians were involved in approximately !INSERT%! of the calls shown above. Some calls involved more than one trade.

TRADE/CRAFT	TRADE INVOLVEMENT (PERCENTAGE)
Electrical	!INSERT!
Plumbing/Pipefitting	!INSERT!
HVAC	!INSERT!
Sheet Metal	!INSERT!
Machinist	!INSERT!
Painting	!INSERT!
Labor	!INSERT!

PERCENTAGE OF CALLS RECEIVED AFTER REGULAR HOURS

Approximate percentage of total emergency, urgent, and routine service calls received after regular working hours and on weekends/holidays:

	1989	1990
Emergency	8%	9%
Urgent	4%	5%
Routine	2%	2%

ACTUAL HOURS REQUIRED FOR COMPLETION

Actual hours required for completion of service calls. This must not be confused with the EPS ***estimated*** hours required for completion, as discussed in Clause C.10.

	1989	1990
0 - 4 hours	93%	94%
4 - 8 hours	5%	4%
8 - 16 hours	1%	1%
Over 16 hours	1%	1%

MINOR WORK

CRAFT	NUMBER OF JOBS [1]
Electrical	!INSERT!
Plumbing/Pipefitting	!INSERT!
HVAC	!INSERT!
Sheetmetal	!INSERT!
Machinist	!INSERT!
Painting	!INSERT!
Laborer	!INSERT!

[1] Craft involvement only; not total jobs.

TRAVEL ZONE	1	2	3	4	5	6	7	TOTAL
No. of jobs performed								
Total unit priced labor hours/zone								

JOB SIZE (UNIT PRICED LABOR HOURS)	(0-16)	(17-40)	(41-80)	(81-120)	(121-160)	TOTAL
1989 (Number of Jobs)						
1990 (Number of Jobs)						

ATTACHMENT J-C9

SERVICE CALL WORK AUTHORIZATION FORM

!**********
NOTE TO SPECIFICATION WRITER: Provide a sample work authorization form which includes space for all of the data discussed in Clause C.10.
**********!

This attachment provides a sample Service Call Work Authorization Form that will be used for ordering and documenting all service call work issued to the Contractor, as specified in the "SERVICE CALL" clause, Section C.

ATTACHMENT J-C10

TRAVEL ZONE MAP

!**********!

NOTE TO SPECIFICATION WRITER: Attach a legible copy of the activity's EPS travel zone map.

**********!

ATTACHMENT J-C11

MINIMUM PREVENTIVE MAINTENANCE REQUIREMENTS

!**********
NOTE TO SPECIFICATION WRITER: In this attachment, provide preventive maintenance checklists for the equipment and systems listed in Attachment J-C1. A generic checklist for centrifugal and screw machine water chiller systems is provided as an example.
**********!

The Contractor shall perform preventive maintenance inspections in accordance with the requirements of this attachment, as specified in the "PREVENTIVE MAINTENANCE INSPECTION AND SERVICE" clause, Section C. The terms "check", "inspect", and similar terms used in this attachment include the performance of parts replacement, lubrication, adjustment, calibration, cleaning, repair, etc. as an integral part of the check or inspection, if warranted. The following checklists are included:

Checklist Number 1	Centrifugal and Screw Machine Water Chiller Systems
Checklist Number 2	Reciprocating Water Chiller Systems
Checklist Number 6	Low Pressure Compressed Air Systems
Checklist Number 11	Cooling Tower Systems
Checklist Number 14	Air Handling Systems
Checklist Number 18	Absorption Chiller Systems
Checklist Number 20	Evaporative Cooling Systems

!ETC!

MINIMUM PREVENTIVE MAINTENANCE CHECKPOINTS
AND FREQUENCIES FOR
CENTRIFUGAL AND SCREW MACHINE WATER CHILLER SYSTEMS

CHECKLIST NUMBER 1

FREQUENCY	CHECKPOINT
Daily	Check all operating pressures and temperatures
	Check all operating gauges, charts, recorders, etc.
	Check oil level in all oil reservoirs
	Check and complete the log sheet with all pertinent entries
	Check purge system for proper operation and drain water as required
	Check oil recovery
	Check system for proper refrigerant level
	Check system for leaks in piping
	Check for vibrations, unusual noises, in bearings, motors, etc.
Monthly	Check control indicator lights for proper operation
	Check condition of sight glasses
	Check oil heaters for proper operation
	Check all pump seals for leaks
Semiannual	Check condenser high pressure cutout
	Check refrigeration low temperature cutout
	Check chill water low temperature cutout
	Check oil pressure regulating valve
	Check oil temperature control
	Check operating thermostat
	Check all safety devices
	Check high motor temperature control
	Check oil pressure differential switch
	Check motor current control

CHECKLIST NUMBER 1 (Con't)

FREQUENCY	CHECKPOINT
Semiannual	Check cycling stats, aquastats, and ambient stats
	Check strainers in water line to motor
	Flush motor water jackets
	Check all pneumatic and electric controls
	Check chilled water flow cutout switch
	Check guide vane drive for proper operation
	Clean all equipment
	Check sureness of guards, doors, and panels
	Lubricate vane control linkage bearings, ball joints, and pivot points
	Lubricate all pumps and motors
	Check accuracy of all gauges and thermometers
	Check pressure relief valves
	Check and calibrate all controls as needed to maintain efficient operation
Annual	Check switch gear/starter/contact points
	Check and test electrical interlocks
	Check all electrical connections
	Check motor overloads (heaters) for wear and damage
	Meg compressor and oil pump motors
	Meg all other motors except fractional horsepower
	Check operating amperage and voltage for all motors and record
	Drain and change oil. For 100 ton and larger units, take oil sample and have laboratory analyze
	Replace oil filter elements
	Remove condenser heads and inspect and clean the tubes
	Remove heat recovery system heads and inspect and clean the tubes

CHECKLIST NUMBER 1 (Con't)

FREQUENCY	CHECKPOINT
Annual	Remove cooler heads and inspect for scale and clean the tubes
	Check vane closed switch for proper operation
	Check recycle timer for proper operation
	Check oil timer switch for proper operation
	Tighten all flange nuts and bolts
	Check capillary tubes for wear, damage, and leaks
	Check all hand valves for operation. Repack and repair as needed
	Check magnetic plug for metallic particles
	Change drier cores
	Check safety and operating switches for proper operation
	Drain and flush oil and refrigerant from purge system
	Clean purge after flushing and check the float assembly and controls
	Clean refrigerant valve motor (RVM) for proper operation
	Check electronic control module for calibration and proper operation
	Check starter for proper operation
	Check all mounting points for secureness
	Check system for refrigerant leaks
	Operate the unit and record a complete test run on the machine log sheet
	Inspect machine exterior, piping, etc., for corrosion and rust. Prime and paint as needed
	Check all structural elements for corrosion, rust, and damage. Prime and paint as needed
	Repair/replace insulation as necessary
	Repair/replace access doors and panels as necessary
	Check and balance chill and condenser water systems

ATTACHMENT J-C12

AIR CONDITIONING EQUIPMENT REQUIRING SEASONAL
START-UP AND SHUT-DOWN AND THAT REMAIN OPERATIONAL YEAR ROUND

This attachment provides a listing of air conditioning equipment that remains in operation year round, and of the systems that require seasonal start up and/or shut-down services, as required by the "SPECIFIC REQUIREMENTS FOR AIR CONDITIONING EQUIPMENT" clause, Section C.

BUILDING NUMBER	EQUIPMENT DESCRIPTION	UNITS THAT STAY ON YEAR ROUND	UNITS AFFECTED BY SEASONAL START-UP AND SHUT-DOWN
02	Split AC System	X	
208	Reciprocating Water Chiller	X	
328	Centrifugal Water Chiller	X	
436	Split AC System	X	X
500	Split AC System	X	
614	Split AC System	X	X
720	Screw Machine Water Chiller	X	
830	Split AC System	X	X
840	Centrifugal Water Chiller	X	
928	Split AC System	X	X

ATTACHMENT J-C13

FACILITIES WITH AIR CONDITIONING
"ON/OFF" TIME CLOCK CONTROLS

This attachment provides the on and off time settings for the facilities that have air conditioning on/off time clock controls.

BUILDING NUMBER	ON	OFF	REMARKS
102	0700	2100	7 days a week
108	0800	1800	Mon, Tue, Wed, Fri
	0800	2000	Thu
	0800	1700	Sat
	0930	1630	Sun
109	0630	1800	Mon - Sun
113 BX	0700	2000	Mon - Fri
	0700	1500	Sat
	0900	1500	Sun
113, Cafeteria	0500	2130	Mon - Fri
	0600	1600	Sat
	0800	1600	Sun
114	0800	2400	Mon - Thu
	0800	0100	Fri - Sat
	1200	2000	Sun
148	0700	1600	Mon - Fri
		Off	Sat & Sun
200	0700	1630	Mon - Fri
		Off	Sat & Sun
138	0730	2400	Mon, Tue, Wed, Thu
	0730		Fri
		0130	Sat
	0900		Sat
		0130	Sun
	0900	2400	Sun
208	0600	1600	Mon - Fri
		Off	Sat & Sun
216	0400	2100	7 days a week
218	0400	2100	7 days a week
235	0600	1600	Mon - Fri
		Off	Sat & Sun

ATTACHMENT J-C14

FILTER MAINTENANCE SCHEDULE

BUILDING NUMBER	EQUIPMENT DESCRIPTION	NUMBER OF FILTERS	REPLACE	FILTER DIMENSIONS
108	Window unit (2-Ton)	1	Monthly	24"x24"x1"
	Window unit (½-Ton)	1	Monthly	16"x20"x1"
	AHU - #1	3	Quarterly	20"x20"x2"
	AHU - #2	4	Quarterly	16"x25"x2"
213	AHU - #1	2	Quarterly	24"x36"x1"
	AHU - #2	4	Quarterly	20"x20"x2"
362	AHU - #1	4	Quarterly	16"x25"x2"
	AHU - #2	3	Quarterly	24"x36"x1"
	AHU - #3	5	Quarterly	20"x25"x2"
	Window unit (1-Ton)	1	Monthly	14"x14"x1"
531	Window unit (1½-Ton)	1	Monthly	20"x20"x1"
	Window unit (1-Ton)	1	Monthly	20"x20"x1"
	AHU - #1	3	Quarterly	20"x25"x2"
	AHU - #2	4	Quarterly	16"x25"x2"
969	AHU - #1	3	Quarterly	20"x20"x2"
	AHU - #2	5	Quarterly	16"x25"x2"
	AHU - #3	2	Quarterly	12"x24"x2"

!ETC!

ATTACHMENT J-C15

COOLING TOWER SYSTEMS CHEMICAL TREATMENT REQUIREMENTS

!**
NOTE TO SPECIFICATION WRITER: Provide list of facilities and/or systems and approximate tonnage capacity that have an ongoing chemical treatment program. Also provide a description of the type and quantity of chemicals historically required to support the treatment program.
**!

This attachment provides a listing of facilities with systems that require chemical treatment of cooling tower condenser water, as described in the "SPECIFIC REQUIREMENTS FOR COOLING TOWER SYSTEMS" clause, Section C.

BUILDING NUMBER	TONS OF COOLING CAPACITY
106	103
138	163
235	290
350A*	225
350B*	225
483/484	100
502	565
542	100
606	170
707	210
757	235

* One cooling tower for both chillers.

The following is a summary of the quantity of chemicals which were required to provide water treatment programs during the 1990 cooling season. This information is not, by itself, considered sufficiently accurate for bidding purposes, but provides an order of magnitude of the types and quantities of chemicals which may be required.

CHEMICAL USAGE FOR 1990 COOLING SEASON

CHEMICAL	PRODUCT	QUANTITY
Scale and corrosion inhibitor	Betz-Entec, Inc. Product 318	300 gallons
Algae and bacteria inhibitor	Betz-Entec, Inc. Product 340	30 gallons
Biocide	Betz-Entec, Inc. Product 440	180 gallons

ATTACHMENT J-C16

CHILLED WATER SYSTEMS CHEMICAL TREATMENT REQUIREMENTS

!**********!

NOTE TO SPECIFICATION WRITER: Provide list of facilities with existing chemical treatment programs for chilled water systems. Also provide a description of the type and quantity of chemicals historically required to support the treatment program.

**********!

This attachment provides a listing of facilities with chilled water systems that require chemical treatment programs. The Contractor shall provide treatment services in accordance with the "CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS" clause, Section C.

BUILDING NUMBER	TONS OF COOLING CAPACITY
106	103
253	85
311	150
483/484	100
500	220
525	125
591	230
611/612	500
707	210
865	235

The following is a summary of the quantity of chemicals which were required to provide water treatment programs during the 1990 cooling season. This information is not, by itself, considered sufficiently accurate for bidding purposes, but provides an order of magnitude of the types and quantities of chemicals which may be required.

CHEMICAL USAGE FOR 1990 COOLING SEASON

CHEMICAL	PRODUCT	QUANTITY
Corrosion inhibitor	Betz-Entec, Inc. Product 338	180 gallons

ATTACHMENT J-E1

LIST OF ENGINEERED PERFORMANCE STANDARDS HANDBOOKS

PUBLICATION NUMBER	HANDBOOK NAME
P-701.0	Planner-Estimator’s Deskguide
P-702.0	Carpentry
P-703.0	Electrical, Electronic
P-704.0	Heating, Cooling & Ventilating
P-705.0	Emergency/Service
P-706.0	Janitorial and Custodial Services
P-707.0	Machine Shop, Machine Repair
P-708.0	Masonry
P-709.0	Moving and Rigging
P-710.0	Paint
P-711.0	Pipefitting and Plumbing
P-712.0	Roads, Grounds, Pest Control, and Refuse Collection
P-713.0	Sheet Metal, Structural Iron and Welding
P-714.0	Trackage
P-715.0	Wharf Building
P-716.0	Unit Price Standards (UPS)
P-717.0	Preventive/Recurring Maintenance

ATTACHMENT J-E2

PERFORMANCE REQUIREMENTS SUMMARY TABLE

!**********
NOTE TO SPECIFICATION WRITER: A PRS table is included in this attachment as required by the NAVFAC P-68, *Contracting Manual*. See paragraph III.F of the User's Guide for additional information.
**********!

The purpose of this attachment is to:

a. List the contract requirements and work requirements considered most critical to satisfactory contract performance (See PRS Column 1).

b. Summarize the standards of performance in the specification for each specified work requirement (See PRS Column 2).

c. Provide maximum allowable defect rates (MADRs) for each work requirement (See PRS Column 3). The MADR is the defect rate in a population of services above which the Contractor's quality control is considered unsatisfactory. The MADR does not represent a threshold above which payment deductions are taken. Deductions are taken for all defects (with credit for rework to the extent appropriate) irrespective of whether the MADR was exceeded or not.

d. Specify the percentage (weight) of contract requirement attributable to each listed work requirement (See PRS Column 4).

!**********
NOTE TO SPECIFICATION WRITER: The percentages in the WEIGHT column are used in conjunction with the Schedule of Deductions to calculate payment deductions for partially performed work. Example payment deduction calculations are shown in each of the sample quality assurance plans in the Quality Assurance Guide of this GPWS. The user should verify that the percentages shown are representative of the activity's requirements, and modify as required. The MADRs shown are suggested rates only.
**********!

PERFORMANCE REQUIREMENTS SUMMARY TABLE

	WORK REQUIREMENTS (Column 1)	STANDARDS OF PERFORMANCE (Column 2)	MAX ALLOW DEFECT RATE (Column 3)	WEIGHT (Column 4)
	1. CONTRACT REQUIREMENT: RECORDS AND REPORTS			
A.	Timely submission or filing	Records and reports submitted or filed when specified (Attachment J-C5)	5%	15% Item 1, Schedule of Deductions
B.	Quality work*	Required information included, is accurate and complete as specified in Section C	5%	85% Item 1, Schedule of Deductions
	2. CONTRACT REQUIREMENT: EMERGENCY SERVICE CALLS			
A.	Timely response	At job site !INSERT! minutes after receipt of call with proper tools and equipment [Paragraph C.10.c(1)(a)]	3%	35% Item 2, Schedule of Deductions
B.	Timely completion	Completed within requirements for urgent or routine service call, as applicable [Paragraph C.10.c(1)]	3%	10% Item 2, Schedule of Deductions
C.	Perform quality work*	Emergency condition arrested, repairs completed in conformance with quality standards, Section C	3%	45% Item 2, Schedule of Deductions
D.	Proper procedures	Complete work authorization and return within one working day, properly classify after normal hours (Paragraph C.10.d)	3%	10% Item 2, Schedule of Deductions
	3. CONTRACT REQUIREMENT: URGENT SERVICE CALLS			
A.	Timely response	At job site hours within !INSERT! hours during regular working hours, and within !INSERT! hours after regular working hours, with proper tools and equipment [Paragraph C.10.c(1)(b)]	5%	20% Item 3, Schedule of Deductions
B.	Timely completion	Once started, all work completed within !INSERT! hours [Paragraph C.10.c(1)(b)]	5%	10% Item 3, Schedule of Deductions

	WORK REQUIREMENTS (Column 1)	STANDARDS OF PERFORMANCE (Column 2)	MAX ALLOW DEFECT RATE (Column 3)	WEIGHT (Column 4)
C.	Perform quality work*	Repairs completed in conformance with quality standards, Section C	5%	60% Item 3, Schedule of Deductions
D.	Proper procedures	Complete work authorization and return within one working day, properly classify after normal hours (Paragraph C.10.d)	5%	10% Item 3, Schedule of Deductions
	4. CONTRACT REQUIREMENT: ROUTINE SERVICE CALLS			
A.	Timely completion	After receipt, completed within !INSERT! working days [Paragraph C.10.c(1)(c)]	5%	15% Item 4, Schedule of Deductions
B.	Perform quality work*	Repairs completed in conformance with quality standards, Section C	5%	75% Item 4, Schedule of Deductions
C.	Proper procedures	Complete work authorization and return within one working day, properly classify after normal hours (Paragraph C.10.d)	5%	10% Item 4, Schedule of Deductions
	5. CONTRACT REQUIREMENT: PREVENTIVE MAINTENANCE INSPECTION AND SERVICE			
A.	Timely completion	Work completed by date specified in approved PM schedule (Paragraph C.12.a)	5%	15% Items 5 - 11, Schedule of Deductions
B.	PM equipment cards and tags	Cards and tags initialed and dated after completion of PM (Paragraph C.12.d)	5%	10% Items 5 - 11, Schedule of Deductions
C.	Quality work*	All check points completed, equipment deficiencies corrected in conformance with quality standards, Section C	5%	60% Items 5 - 11, Scheduled of Deductions
D.	Weekly PM completion report	All required information provided, submitted by !INSERT TIME! each Monday (Paragraph C.12.b)	5%	15% Items 5 - 11, Schedule of Deductions

	WORK REQUIREMENTS (Column 1)	STANDARDS OF PERFORMANCE (Column 2)	MAX ALLOW DEFECT RATE (Column 3)	WEIGHT (Column 4)
		6. CONTRACT REQUIREMENT: EQUIPMENT OPERATIONS		
A.	Quality work*	Equipment operated in in conformance with manufacturer recommendations (Clause C.13)	5%	80% Item 12, Schedule of Deductions
B.	Operation log sheet	Maintained as specified, submitted with monthly invoice (Paragraph C.13.b)	5%	20% Item 12, Schedule of Deductions
		7. CONTRACT REQUIREMENT: START-UP/SHUT-DOWN SERVICES		
A.	Timely completion	Work completed within !INSERT! calendar days of specified start date [Paragraph C.14.a(1)]	5%	20% Item 13, Schedule of Deductions
B.	Quality work*	Specific checks, procedures and operational checks performed, equipment deficiencies corrected in accordance with quality standards, Section C [Paragraph C.14.a(2)]	5%	70% Item 13, Schedule of Deductions
C.	Work completion report	Submitted within !INSERT! working days after completion of start-up/shut-down, needed repairs identified [Paragraph C.14.a(2)]	5%	10% Item 13, Schedule of Deductions
		8. CONTRACT REQUIREMENT: FILTER MAINTENANCE		
A.	Timely completion	Filters changed or cleaned when scheduled (Attachment J-C14)	5%	20% Item 14, Schedule of Deductions
B.	Quality work	Filters changed or properly cleaned (Paragraph C.14.h)	5%	80% Item 14, Schedule of Deductions
		9. CONTRACT REQUIREMENT: CHEMICAL TREATMENT OF COOLING TOWER WATER		
A.	pH level	Within the limits specified in the treatment program (Paragraph C.15.a)	5%	25% Item 15, Schedule of Deductions
B.	Conductivity	Within the limits specified in the treatment program (Paragraph C.15.a)	5%	25% Item 15, Schedule of Deductions

WORK REQUIREMENTS (Column 1)		STANDARDS OF PERFORMANCE (Column 2)	MAX ALLOW DEFECT RATE (Column 3)	WEIGHT (Column 4)
C.	Corrosion and scale inhibitor level	Within the limits specified in the treatment program (Paragraph C.15.a)	5%	25% Item 15, Schedule of Deductions
D.	Biocide level	Within the limits specified in the treatment program (Paragraph C.15.a)	5%	25% Item 15, Schedule of Deductions
	10. CONTRACT REQUIREMENT: CHEMICAL TREATMENT FOR CHILLED WATER SYSTEMS			
A.	Timely Completion	Make checks/tests as scheduled (Clause C.16)	5%	10% Item 16, Schedule of Deductions
B.	Quality Work*	Check pH and corrosion inhibitor levels, make treatment program changes, if required (Clause C.16)	5%	90% Item 16, Schedule of Deductions
	11. CONTRACT REQUIREMENT: CERTIFICATION OF UNFIRED PRESSURE VESSELS			
A.	Timely completion	Vessels prepared for inspection by the date specified by the ACO (Paragraph C.17.b)	5%	25% Item 17, Schedule of Deductions
B.	Quality work*	Vessels prepared for inspection in accordance with applicable references (Paragraph C.17.b)	5%	75% Item 17, Schedule of Deductions
	12. CONTRACT REQUIREMENT: MINOR WORK			
A.	Timely completion	Urgent minor work completed within !INSERT! days, routine minor work completed within !INSERT! days (Paragraph C.11.d)	3%	20% of Unit Prices, Contract Line Item 0002
B.	Quality work*	Work performed in conformance with quality standards, Section C	3%	80% of Unit Prices, Contract Line Item 0002

*Unsatisfactory performance of this work requirement will result in an unsatisfactory rating for the entire contract requirement.

ATTACHMENT J-G2

INVOICING INSTRUCTIONS

!**********
NOTE TO SPECIFICATION WRITER: A sample invoice format should be included in this Attachment. A well thought out invoice format simplifies verification of the amount billed and the calculation of payment deductions.
**********!

END OF SECTION J

QUALITY ASSURANCE GUIDE

FOR

HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION; AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

QUALITY ASSURANCE GUIDE
HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION;
AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

TABLE OF CONTENTS

QUALITY ASSURANCE GUIDE
HEATING, VENTILATING, AND AIR CONDITIONING; REFRIGERATION;
AND COMPRESSED AIR SYSTEMS; OPERATION, MAINTENANCE, AND REPAIR

I. INTRODUCTION. Quality assurance (QA) is a program undertaken by the Government to provide some measure of the quality of goods and services purchased from a Contractor. To accomplish this the Government, in this case the naval shore activity contracting for Heating, Ventilating, and Air Conditioning (HVAC); Refrigeration; and Compressed Air Systems; Operation, Maintenance, and Repair services, must develop and implement a system that will ensure that the quantity and quality of the goods and services received comply with the requirements of the contract. This QA Guide is designed to assist the Facilities Support Contract Manager (FSCM) or other user in setting up the activity's QA program. The user is advised to refer to the NAVFAC manual MO-327, *Facility Support Contract Quality Management Manual* and the NAVFAC *Random Sampling for Extrapolated Deductions (RSED V3.2)* implementation guide for more detailed information on the development and implementation of a QA Program.

A. Overview. This Guide suggests specific methods for monitoring HVAC operation and maintenance services and provides sample QA Plans. These sample plans must be tailored concurrently with the tailoring of the GPWS to develop a unique QA program that fits the needs of the activity. The Guide is divided into four parts:

1. The Introduction presents an overview and gives information on Quality Assurance Evaluator (QAE) staffing and training.

2. QA Plan Development discusses special considerations that affect the way in which HVAC operation and maintenance services may be monitored, and suggests specific evaluation methods for each service included in this GPWS.

3. The sample QA plans include numerical examples, suggested evaluation work sheets, and sample Monthly Payment Analysis Forms for most of the services included in this GPWS. The Payment Analysis Forms illustrate how to use the Performance Requirements Summary (PRS) Table and inspection results to calculate payment deductions. The sample plans provided must be tailored by the user to conform with the tailored PWS.

4. Contractor's Overall Performance discusses how to use the QAE's inspection results to make an overall evaluation of Contractor performance, and provides a sample monthly summary report format.

B. QAE Training. Personnel tasked with monitoring the HVAC services Contractor's performance must be experienced in the mechanical trades and adequately trained in QA methods and procedures in order to effectively implement the activity's QA program.

1. NAVFAC P-68, *Contracting Manual*, requires all individuals assigned QAE duties to attend the QAE training course provided by each of the NAVFAC geographical Engineering Field Divisions (EFDs) within six months of their assignment, or have equivalent training as determined by the ACO. If this training has not been received, the activity should take steps to have the QAE(s) attend the next available course and in the meantime should develop a local training program. EFD Code 10s/16s should be contacted for QAE training scheduling or assistance. Additional training may also be required to ensure that appropriate technical expertise is available to inspect HVAC,

refrigeration, and compressed air plants and systems operation and maintenance services.

2. In addition to being intimately familiar with the requirements of the HVAC operation and maintenance specification, QAEs must also familiarize themselves with the procedures which will be used to order work, how the QAE will be notified when work has been completed and is ready for inspection, how customer complaints will be handled, etc.

C. QAE Staffing. Obviously the most well developed QA program will not be effective if QAE staffing is inadequate. Ideally QAE staffing should be based on a pre-determined number of contract inspections (QA plans) and related work requirements rather than on the availability of QAEs. Once adequate QA plans have been developed, determining accurate QAE staffing levels to implement the plans is a relatively simple task involving an analysis of each plan's requirements. This analysis involves determining the average time needed to complete each of the inspections required (sample size or quantity of work) by each plan including travel time requirements, time required to prepare monthly reports and perform other administrative duties, time to perform any non-surveillance duties, etc. The NAVFAC EFDs have experience in conducting these staffing analyses and should be contacted if assistance is needed.

II. QUALITY ASSURANCE PLAN DEVELOPMENT. Ideally, QA plan development should be accomplished concurrently with development of the PWS, and viewed as a single process. The two are closely interrelated since one (the PWS) defines required work outputs and quality standards while the other defines how work outputs will be observed and measured. Many of the inspection problems which tend to turn up after contract award can be avoided by careful up-front coordination between the specification and QA plan writers. Chapter 4 and 6 of NAVFAC MO-327 discuss methods of surveillance, inspection documentation, development of QAE schedules, and other issues related to the development of QA plans. The following discussion provides information relating specifically to surveillance of HVAC operation and maintenance.

A. Functional Considerations. HVAC operation and maintenance monitoring poses several unique requirements for the QAE. The following considerations are offered for the user's information.

1. Difficulty of Inspection. Many preventive maintenance inspection and equipment operation services, due to the nature of the work, are difficult, if not impossible, to inspect without being present during their performance. The QAE will need to consider this when scheduling surveillance of preventive maintenance and operations services, and will need to use considerable judgment when determining whether such work has been satisfactorily performed.

2. Relative Importance. The relative importance of the contract requirements must be considered during the development of QA plans since some contract requirements are more important than others. This consideration is important when deciding on a method of surveillance for a particular service, if and when to perform unscheduled inspections, whether to observe work in progress or just the results, etc. Nonperformance or poor performance of certain contract requirements may have an impact on an activity's mission, such as response to an emergency service call to return service to the walk-in cooler system in the package store. If this is the case, that requirement should be considered very important. If, on the other hand, the omission of a single occurrence of an item of work has little or no effect, that contract requirement

should be considered relatively unimportant, when compared to other contract requirements.

3. Customer Complaint Program. A properly established and administered customer complaint program can be of great benefit to the QAE in identifying poorly performed work and reducing the number of multiple service calls ordered to correct the same problem. The method of making customers aware of the contract's requirements and how to call in complaints; and the internal procedures used to receive, record, respond to, and track customer complaints needs to be carefully coordinated between customers and the FSCM prior to contract award. Each service call received should be screened to ensure it is not a repeat call for a repair previously completed by the Contractor, which is still under warranty. Such calls are complaints, even if not identified as such by the customer, and should be passed to the QAE for validation and rework if appropriate. A Customer Complaint form, similar to that contained in Appendix H of NAVFAC MO-327, should be used to record actions taken on each complaint received. Most complaints will require an on site validation visit by the QAE. Adequate QAE time must be made available to validate complaints, or customers will soon perceive that complaining is a "waste of time". Of course, payment deductions may be made only on those complaints which are validated by the QAE.

4. Rework. As specified in the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES" clause, the Government may require the Contractor to reperform work that has been identified as being poorly performed or not performed, provided a reasonable amount of time is allowed for the rework to be completed. The following should be considered.

a. The QAE will be too busy performing surveillance during most of the day to stop and call the Contractor every time a deficiency is found or a complaint is received. Therefore, the Contractor should be notified of customer complaints and discrepancies found by the QAE only at the end of the working day, unless the deficiency could affect the health, safety, or comfort of customers; or affect the mission of the activity and cannot wait until the next scheduled work day for correction. The easiest way to make the Contractor aware of all noted deficiencies in writing, as required by the "CONSEQUENCES" clause, is to provide copies of completed EVALUATION WORK SHEETS daily. As documentation that work sheets were received, the Contractor should sign and return each form. However, the QAE should not spend time "chasing down" the Contractor's representative to get the work sheets signed.

b. Rework should normally be allowed for defects in quality of work; however, defects in some work requirements, such as timely response and timely completion, obviously cannot be reworked.

c. Invoice payment deductions should always be made when a documented deficiency is not satisfactorily reworked. Liquidated damages should be deducted for all documented deficiencies, whether or not rework is accomplished.

B. Selection of Methods of Surveillance. Chapter 4 of NAVFAC MO-327 provides a general discussion of the five methods of surveillance available and the factors which influence which method(s) should be selected for use. The factors influencing the selection of a method of surveillance for a given service include the number (population) of items to be inspected; the importance, characteristics, and location of the service; and the availability of QAE resources. Specific factors which influence the selection of evaluation

methods for HVAC operation and maintenance services are discussed below for each method of surveillance.

1. 100% Inspection. One hundred percent inspection is generally used for those services which are considered very important, those which have relatively small monthly populations, and those included in the indefinite quantity portion of the contract. 100% inspection is recommended for the inspection of records and reports and the following services included in this GPWS.

a. Emergency Service Calls. Since proper performance of emergency calls can have a major impact on the health, safety, and comfort of customers, as well as critical activity missions, 100% inspection is recommended. If calls are properly classified, the number of emergency calls at the typical activity would not make 100% inspection impractical.

b. Minor Work. Before the QAE can legitimately certify satisfactory completion of work on an indefinite quantity delivery order for minor work, the job obviously must be inspected at least once. Therefore, 100% inspection is recommended for all indefinite quantity delivery orders for minor work.

c. Records and Reports. 100% inspection is recommended since the receipt of accurate records and reports can be critical to monitoring the Contractor's performance, determining if cooling tower water treatment programs are adequate, allocating contract costs to customers, etc.

d. Certification of Unfired Pressure Vessels. Since pressure vessel certifications are made by a Government furnished inspector, which may or may not be the QAE, 100% inspection will be performed by default.

e. Other Services. 100% is also recommended for the inspection of start-up/shut-down services and chemical treatment of chilled water systems. The quantity of both of these services is likely to be small, and they are important relative to other services included in the contract.

2. Random Sampling. Surveillance based on random sampling evaluates a portion of the work, accurately estimating Contractor performance through the use of statistical theory. Random sampling is most useful on large homogeneous populations where 100% inspection is not required or feasible. Also, if appropriate provisions are included in the specification and the random sampling is properly conducted, the percentage of defective work items found in the sample (less a small adjustment for inaccuracies) may be extrapolated and deducted from the Contractor's payment invoice. In the case of HVAC operation and maintenance services, random sampling would likely not be practical in most contracts due to the relatively small population of homogeneous services. However, those activities with large contracts may want to consider random sampling for the following services.

a. Preventive Maintenance Inspection and Service. Random sampling **without** extrapolated deductions may be used for the inspection of preventive maintenance (PM) inspection services, **if** the population of services is large enough to make random sampling practical. The population will likely **not** be homogeneous enough to make RSED practical, i.e., a daily PM check on a centrifugal water chiller system requires a vastly different amount of the Contractor's effort than say a semiannual or annual check on that same piece of

equipment. Also, since unit prices are obtained for each different type of inspection in the Schedule of Deductions, it would not be practical to extrapolate payment deductions over a large population of different PM services.

b. Routine Service Calls. Random sampling should at least be considered for the inspection of routine service calls if the expected number of routine calls is large enough. For example, if the number of routine calls averages 100 per month, the normal and minimum sample sizes would be 69 (69%) and 40 (40%) respectively; probably too large to be practical. However, if the average number of calls averages 200 per month, the normal and minimum sample sizes would be 104 (52%) and 50 (25%). Random sampling without extrapolated deductions would be more practical in this situation since the minimum sample size of 25% could be used.

c. Filter Maintenance Services. Although random sampling could be used to inspect filter maintenance services, its use is not recommended due to the difficulty of assigning a service location to each filter in the population. If the activity wants to take time to assign a service location to each filter and the population is large enough, then random sampling should be considered.

3. Planned Sampling. Planned sampling is similar to random sampling in that it is based on evaluating a portion of the work as the basis for estimating the Contractor's performance. Samples are selected based on a subjective rationale and the sample size is arbitrarily determined. Planned sampling is useful when population sizes are not large enough or homogeneous enough to make random sampling practical. Planned sampling is recommended for the inspection of urgent and routine service calls, preventive maintenance, equipment operations, filter maintenance, and chemical treatment of cooling tower water services, since the population of these services are generally small and/or non-homogeneous.

4. Unscheduled Inspections. An unscheduled inspection is what the name implies. Since it does not provide any measure of the Contractor's performance it should be used only to support other methods and never as a primary method of surveillance.

5. Validated Customer Complaints. This method is appropriate as a supportive method of surveillance for urgent and routine service calls, and filter maintenance. See paragraph II.A.3 of this QA Guide.

C. Performance Requirements Summary. As discussed previously in the User's Guide (paragraph III.F), the PRS table will be used primarily by the ACO in conjunction with the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES", "ESTIMATING THE PRICE OF NONPERFORMED OR UNSATISFACTORY WORK", and "SCHEDULE OF DEDUCTIONS" clauses, in making payment deductions for unsatisfactory performance or nonperformance of contract requirements. The table is also very useful in the preparation of QA plans since it summarizes the work requirements, standards of performance, and maximum allowable defect rates (MADRs) for each contract requirement. A sample PRS table, which reflects the contract requirements and work requirements of this GPWS, is provided in Attachment J-E2. Of course, they must be modified to reflect the requirements of the tailored PWS. NAVFAC MO-327 and the NAVFAC RSED (V3.2) implementation guide provide guidance on the development of PRS tables, and should be referred to by the user.

1. MADRs are defect rates above which the Contractor's quality control is considered unsatisfactory for any particular work requirement. The MADR selected for any particular work requirement should reflect both the expected population of services and the requirement's importance. For example, the MADR for timely emergency service call response should be smaller than that for urgent service call response. Note that MADRs do not affect sample sizes or the method of calculating payment deductions in any way. Suggested values are included in Attachment J-E2; however, these must be tailored by the user.

2. In the WEIGHT column, the price of each work requirement is specified as a percentage of the price of the contract requirement with which it is associated. Careful consideration must be given to objectively assigning these percentages since they will be used in making payment deductions. One method which may be used is to calculate the cost of each work requirement using Engineered Performance Standards (EPS) and then use these costs to determine the percentage to be assigned to each work requirement. Values for timeliness work requirements will be the most difficult to determine since they are by nature subjective. The percentages suggested in Attachment J-E2 should be carefully reviewed and tailored by the user.

III. SAMPLE QUALITY ASSURANCE PLANS. There are twelve sample QA plans provided in this GPWS. They are:

QA Plan #1 - Records and Reports
QA Plan #2 - Emergency Service Calls
QA Plan #3 - Urgent Service Calls
QA Plan #4 - Routine Service Calls
QA Plan #5 - Preventive Maintenance Inspection and Service
QA Plan #6 - Equipment Operations
QA Plan #7 - Start-up/Shut-down Services
QA Plan #8 - Filter Maintenance Services
QA Plan #9 - Chemical Treatment of Cooling Tower Water
QA Plan #10 - Chemical Treatment of Chilled Water Systems
QA Plan #11 - Certification of Unfired Pressure Vessels
QA Plan #12 - Minor Work

A. Of course, each sample QA plan must be tailored to reflect changes made by the user to Section C of the GPWS and the PRS table, and changes in methods of surveillance, evaluation work sheets, etc. For example, if there is a large number of routine service calls, the user may want to use random sampling as the method of surveillance.

B. Tailored QA plans should be self contained documents written in sufficient detail to preclude extensive reference to other documents or manuals. Tailored plans should contain samples of all evaluation work sheets, summary reports, and other forms which will be used for documenting Contractor performance. Sample selection, evaluation, analysis of results, and other procedures should be as detailed as possible.

C. Sample size determinations, sampling procedures, and payment analysis calculations in the sample QA plans are based on manual methods. The user should be aware that numerous computerized methods of performing these functions have been developed which greatly reduce the time and number of manual calculations required, especially if random sampling is selected as the method of surveillance. One such computer program recently developed by NAVFAC will determine the sample size required for a given population of services to be

randomly sampled, select the appropriate number of random numbers within a given range, perform payment calculations based on inspection results, and perform random sampling confidence calculations. Interested users should contact their geographical EFD for copies of this and other programs which may be available.

QUALITY ASSURANCE PLAN #1
RECORDS AND REPORTS

1. Contract Requirement. Records and Reports

Work Requirements	Standards of Performance
a. Timely Submission or Filing	Records and reports submitted or filed when specified (Attachment J-C5)
b. Quality Work	Required information included and accurate, completed as specified in Section C

2. Primary Method of Surveillance. One hundred percent inspection

3. Maximum Allowable Defect Rate (MADR)

a. Timely Submission or Filing	5%
b. Quality Work	5%

4. Quantity of Work. The total number of reports required to be submitted during the monthly evaluation period and the total number of records that should have been maintained by the Contractor during the monthly evaluation period. The following records and reports are included:

Reports
- Cost Accounting
- Chilled Water System Chemical Treatment Inspection
- Cooling Tower Circulating Water Test Results
- Cooling Tower Makeup Water Test Results

Records
- Facility History Files
- Preventive Maintenance Inspection
- As-Built Drawings

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedures. Each report will be evaluated after its due date, as specified in Attachment J-C5. Each record will be reviewed and evaluated at least once during the evaluation period. Evaluations of work quality will include checks of whether records and reports are accurate and complete. In most cases where the quality of work is graded unsatisfactory, timely submission or timely filing will also be considered unsatisfactory. The results of all inspections will be recorded on the attached EVALUATION WORK SHEET, including descriptions of any noted defects, rework data, and other appropriate information. Copies of all negative reports will be provided to the Contractor. Rework will normally be allowed when practical.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate ODRs and recommended payment deductions for each work requirement.

a. Payment deductions will be calculated on a MONTHLY PAYMENT ANALYSIS FORM. A separate form will be filled out for each type of record/report since there are separate prices for each of these services in the Schedule of Deductions. An example MONTHLY PAYMENT ANALYSIS FORM for circulating water test results is attached.

b. ODRs will be calculated for each work requirement for the overall performance of records/reports by combining the results from all records/reports MONTHLY PAYMENT ANALYSIS FORMS and using the following formula:

$$\text{ODR} = \frac{\text{Total Number of Defects Observed}}{\text{Number of Records/Reports}}$$

(1) If the ODR for a work requirement is less than the MADR, the Contractor's overall performance of that requirement is satisfactory for the month. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work.

(2) If the ODR for a work requirement is greater than the MADR, the Contractor's overall performance of that requirement is unsatisfactory, and the QAE should recommend to the FSCM that a CDR be issued to the Contractor or that stronger action be taken.

EVALUATION WORK SHEET
RECORDS AND REPORTS
QA PLAN #1

REPORT TITLE OR RECORD TYPE	DUE DATE	DATE RECEIVED OR FILED	WORK REQUIREMENTS		REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
			TIMELINESS	QUALITY WORK			

CONTRACTOR'S SIGNATURE/DATE

QAE'S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
RECORDS AND REPORTS

Contract Requirement: Circulating Water Test Results

Analysis for period 1 Aug 91 - 31 Aug 91		TIMELINESS	QUALITY WORK
a.	Relative value of services (from PRS table)	15%	85%
b.	Price per service (from Schedule of Deductions Item 1.e)	$ 0.66	$ 3.74
c.	Population	44	44
d.	Total price of service (b X c)	$ 29.04	$ 164.56
e.	Number of defects	3	5
f.	Number of services reworked by Contractor	0	0
g.	Number of services reworked by Gov't or others	0	0
h.	Net services deducted at schedule price (e - f - g)	3	5
i.	Net amount to deduct (b X h)	$ 1.98	$ 18.70
j.	Deduct for Gov't rework actual cost or at schedule price (b X g)	$ 0	$ 0
k.	LDs Gov't rework (20% X j)	$ 0	$ 0
l.	LDs on all other defects [10% X b X (e - g)]	$ 0.19	$ 1.87
m.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0
n.	Total deductions (i + j + k + l + m)	$ 2.17	$ 20.57

TOTAL PAYMENT DEDUCTIONS = $ 22.74

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #2
EMERGENCY SERVICE CALLS

1. Contract Requirement. Emergency Service Calls

Work Requirements	Standards of Performance
a. Timely Response	At job site !INSERT! minutes after receipt of call with proper tools and equipment [Paragraph C.10.c(1)(a)]
b. Timely Completion	Completed within requirements for urgent or routine service call, as applicable [Paragraph C.10.c(1)]
c. Perform Quality Work	Emergency condition arrested, repairs completed in conformance with quality standards of Section C
d. Proper Procedures	Completed work authorization and returned within one working day, properly classified after normal hours (Paragraph C.10.d)

2. Primary Method of Surveillance. One hundred percent inspection

3. Maximum Allowable Defect Rate (MADR)

a. Timely Response	3%
b. Timely Completion	3%
c. Perform Quality Work	3%
d. Proper Procedures	3%

4. Quantity of Work. Historical average by month:

JAN	5	APR	20	JUL	13	OCT	8
FEB	6	MAY	21	AUG	13	NOV	6
MAR	6	JUN	19	SEP	8	DEC	5

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedures. As soon as possible after completion of each emergency service call and turn in of completed work authorization forms, the QAE will make an on-site visit and evaluate each of the work requirements listed in paragraph l as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information will be recorded, if appropriate. In most all instances where the quality of work is considered unsatisfactory, timely completion will also be considered unsatisfactory. Provide copies of all negative inspection reports to the Contractor.

a. Visiting the site as soon as possible after completion of the work is very important so that the work is "fresh" and relatively easy to inspect. Evaluate response, completion, and proper procedures based on completed work authorization and service call log information.

b. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. Therefore, each call marked for rework must be reinspected by the QAE to see if the work was satisfactorily completed, and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate observed defect rates (ODRs) and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. Payment deductions will be made for all documented defects as calculated on the MONTHLY PAYMENT ANALYSIS FORM. If the ODR is less than ½ of the MADR the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work.

b. If the ODR is greater than the MADR, overall performance of that work requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
EMERGENCY SERVICE CALLS
QA PLAN #2

WORK AUTH NUMBER	BUILDING NUMBER/ SYSTEM	WORK DESCRIPTION	WORK REQUIREMENTS				REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
			TIMELY RESPONSE	TIMELY COMPLETION	QUALITY WORK	PROPER PROCEDURES			

CONTRACTOR'S SIGNATURE/DATE

QAE'S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
EMERGENCY SERVICE CALLS

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY RESPONSE	TIMELY COMPLETE	QUALITY WORK	PROPER PROCEDURES
a.	Relative value of services (from PRS table)	35%	10%	45%	10%
b.	Price for contract requirement (from Schedule of Deductions Item 2)	$1,155.00	$ 330.00	$1,485.00	$ 330.00
c.	Population	34	34	34	34
d.	Price per service (b ÷ c)	$ 33.97	$ 9.71	$ 43.68	$ 9.71
e.	Number of defects	3	2	0	1
f.	Observed Defect Rate (e ÷ c)	8.8%	5.9%	0%	2.9%
g.	Number of services reworked by Contractor	0	0	0	0
h.	Number of services reworked by Gov't or others	0	0	0	0
i.	Net services deducted at schedule price (e - g - h)	3	2	0	1
j.	Net amount to deduct (d x i)	$ 101.91	$ 19.42	$ 0	$ 9.71
k.	Deduct Gov't rework actual cost or at schedule price (d x h)	$ 0	$ 0	$ 0	$ 0
l.	LDs on Gov't rework (20% x k)	$ 0	$ 0	$ 0	$ 0
m.	LDs on all other defects [10% x d x (e - h)]	$ 10.91	$ 1.94	$ 0	$ .97
n.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0	$ 0
o.	Total deductions (j + k + l + m + n)	$ 112.82	$ 21.36	$ 0	$ 10.68

TOTAL PAYMENT DEDUCTIONS = $ 144.86

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #3
URGENT SERVICE CALLS

1. Contract Requirement. Urgent Service Calls

Work Requirements	Standards of Performance
a. Timely Response	At job site within !INSERT! hours during regular working hours, and within !INSERT! hours after regular working hours with proper tools and equipment [Paragraph C.10.c(1)(b)]
b. Timely Completion	Once started, all work completed within !INSERT! hours [Paragraph C.10.c(1)(b)]
c. Perform Quality Work	Repairs completed in conformance with quality standards, Section C
d. Proper Procedures	Completed work authorization and returned within one working day, properly classified after normal hours (Paragraph C.10.d)

2. Primary Method of Surveillance. Planned sampling supported by unscheduled inspections and validated customer complaints.

3. Maximum Allowable Defect Rate (MADR)

a. Timely Response	5%
b. Timely Completion	5%
c. Perform Quality Work	5%
d. Proper Procedures	5%

4. Quantity of Work. Average by month:

JAN	14	APR	43	JUL	35	OCT	22
FEB	13	MAY	59	AUG	36	NOV	20
MAR	16	JUN	49	SEP	29	DEC	16

5. Level of Surveillance. The normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect rate (ODR) for response or quality of work exceeds the MADR during any given month. If only the ODR for completion or procedures exceeds the MADR, consider increasing the level of surveillance for those work requirements only. Go to reduced surveillance if the ODRs for both response and quality of work are less than one half the MADR for two consecutive months.

6. Sample Size. The following sample sizes are established for each level of surveillance.

Reduced - 10% of the calls completed
Normal - 25% of the calls completed
Increased - 50% of the calls completed

7. Sampling Procedures. As completed urgent service call work authorization forms are turned in by the Contractor, the QAE will arbitrarily select every fourth work authorization form (if at normal surveillance) for inspection. Choose every tenth call if at reduced surveillance, every other call if at increased surveillance.

8. Evaluation Procedures. As soon as possible after the call has been selected, the QAE will make an on-site visit and evaluate each of the work requirements listed in paragraph 1 as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information will be recorded, if appropriate. In most all instances when the quality of work is considered unsatisfactory, timely completion will also be considered unsatisfactory. Visiting the site as soon as possible after completion of the work is very important so that the work is "fresh" and relatively easy to inspect. Evaluate response, completion, and proper procedures based on completed work authorization and service call log information.

a. Customer Complaints. The QAE will validate each customer complaint received on the standard customer complaint form. Normally, site visits will be required to validate complaints.

b. Unscheduled Inspections. Unscheduled inspections may be conducted on any urgent service call, but should be limited to those of particular importance, such as calls affecting mission critical facilities, calls where performance problems have been noted in the past, etc. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

c. Rework. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. Therefore, each call marked for rework must be reinspected by the QAE to see if the work was satisfactorily completed, and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month’s inspections, and calculate ODRs and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM, and determine if any change in the level of surveillance is needed for the coming evaluation period (see paragraph 5 above). An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. If the ODR is less than ½ of the MADR the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work, and should consider whether or not reduced surveillance should be used for the coming evaluation period. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation

period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
URGENT SERVICE CALLS
QA PLAN #3

WORK AUTH NUMBER	BUILDING NUMBER/ SYSTEM	WORK DESCRIPTION	WORK REQUIREMENTS				REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
			TIMELY RESPONSE	TIMELY COMPLETION	QUALITY WORK	PROPER PROCEDURES			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
URGENT SERVICE CALLS

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY RESPONSE	TIMELY COMPLETE	QUALITY WORK	PROPER PROCEDURES
a.	Relative value of services (from PRS table)	20%	10%	60%	10%
b.	Price for contract requirement (from Schedule of Deductions, Item 3)	$1,548.00	$ 774.00	$4,644.00	$ 774.00
c.	Population	86	86	86	86
d.	Price per service (b ÷ c)	$ 18.00	$ 9.00	$ 54.00	$ 9.00
e.	Number of services sampled (Normal)	22	22	22	22
f.	Number in sample defective	5	3	2	1
g.	Defects observed outside sample	3	0	1	0
h.	Total observed defects (f + g)	8	3	3	1
i.	Observed Defect Rate (f ÷ e)	22.7%	13.6%	9.0%	4.5%
j	Number of services reworked by Contractor	0	0	0	0
k.	Number of services reworked by Government or others	0	0	0	0
l.	Net services deducted at schedule price (h - j - k)	8	3	3	1
m.	Net amount to deduct (d x l)	$ 144.00	$ 27.00	$ 162.00	$ 9.00
n.	Deduct Government rework actual cost or at schedule price(d x k)	$ 0	$ 0	$ 0	$ 0
o.	LDs on Government rework (20% x n)	$ 0	$ 0	$ 0	$ 0
p.	LDs on all other defects [10% x d x (h - k)]	$ 14.40	$ 2.70	$ 16.20	$ 90
q.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0	$ 0
r.	Total deductions (m + n + o + p + q)	$ 158.40	$ 29.70	$ 178.20	$ 9.90

TOTAL PAYMENT DEDUCTIONS = $ 376.20

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #4
ROUTINE SERVICE CALLS

1. Contract Requirement. Routine Service Calls

Work Requirements	Standards of Performance
a. Timely Completion	After receipt, completed within !INSERT! working days [Paragraph C.10.c(1)]
b. Perform Quality Work	Repairs completed in conformance with quality standards, Section C
c. Proper Procedures	Completed work authorization and returned within one working day, properly classified after normal hours (Paragraph C.10.d)

2. Primary Method of Surveillance. Planned Sampling supported by unscheduled inspections and validated customer complaints.

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	5%
b. Perform Quality Work	5%
c. Proper Procedures	5%

4. Quantity of Work. Average by month:

JAN	35	APR	78	JUL	74	OCT	43
FEB	26	MAY	116	AUG	76	NOV	38
MAR	30	JUN	97	SEP	58	DEC	29

5. Level of Surveillance. The normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect rate (ODR) for quality of work exceeds the MADR during any given month. If only the ODR for completion or procedures exceeds the MADR, consider increasing the level of surveillance for those work requirements only. Go to reduced surveillance if the ODR for quality of work is less than one half the MADR for two consecutive months.

6. Sample Size. The following sample sizes are established for each level of surveillance:

Reduced - 10% of the calls completed
Normal - 25% of the calls completed
Increased - 50% of the calls completed

7. Sampling Procedures. As completed routine service call work authorization forms are turned in by the Contractor, the QAE will arbitrarily select every fourth work authorization form (if at normal surveillance) for inspection. Choose every tenth call if at reduced surveillance, every other call if at increased surveillance.

8. Evaluation Procedures. As soon as possible after the call has been selected, the QAE will make an on-site visit and evaluate each of the work

requirements listed in paragraph l as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information will be recorded, if appropriate. In most all instances when the quality of work is considered unsatisfactory, timely completion will also be considered unsatisfactory. Visiting the site as soon as possible after completion of the work is very important so that the work is "fresh" and relatively easy to inspect. Evaluate completion and proper procedures based on completed work authorization and service call log information.

a. Unscheduled Inspections. Unscheduled inspections may be conducted on any routine service call, but should be limited to those of particular importance, such as calls where performance problems have been noted in the past, etc. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

b. Customer Complaints. The QAE will validate each customer complaint received on the standard customer complaint form. Normally, site visits will be required to validate complaints.

c. Rework. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. Therefore, each call marked for rework must be reinspected by the QAE to see if the work was satisfactorily completed, and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month’s inspections, calculate ODRs and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM, and determine if any change in the level of surveillance is needed for the coming evaluation period (see paragraph 5 above). An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work, and should consider whether or not reduced surveillance should be used for the coming evaluation period. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
ROUTINE SERVICE CALLS
QA PLAN #4

WORK AUTH NUMBER	BUILDING NUMBER/ SYSTEM	WORK DESCRIPTION	WORK REQUIREMENTS			REWORK ORDERED DATE/TIME	REWORK COMPLETE DATE/TIME	REMARKS
			TIMELY COMPLETION	QUALITY WORK	PROPER PROCEDURES			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
ROUTINE SERVICE CALLS

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	QUALITY WORK	PROPER PROCEDURES
a.	Relative value of services (from PRS table)	15%	75%	10%
b.	Price for contract requirement (from Schedule of Deductions, Item 4)	$ 2,012.70	$ 10,063.50	$ 1,341.80
c.	Population	138	138	138
d.	Price per service (b ÷ c)	$ 14.58	$ 72.92	$ 9.72
e.	Number of services sampled (Normal)	35	35	35
f.	Number in sample defective	4	3	3
g.	Defects observed outside sample	2	2	1
h.	Total observed defects (f + g)	6	5	4
i.	Observed Defect Rate (f ÷ e)	11.4%	8.5%	8.5%
j	Number of services reworked by Contractor	0	0	1
k.	Number of services reworked by Government or others	0	0	0
l.	Net services deducted at schedule price (h - j - k)	6	5	3
m.	Net amount to deduct (d x l)	$ 87.48	$ 364.60	$ 29.16
n.	Deduct Government rework actual actual cost or at schedule price(d x k)	$ 0	$ 0	$ 0
o.	LDs on Government rework (20% x n)	$ 0	$ 0	$ 0
p.	LDs on all other defects [10% x d x (h - k)]	$ 8.74	$ 34.36	$ 3.88
q.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0
r.	Total deductions(m + n + o + p + q)	$ 96.22	$ 401.06	$ 33.04

TOTAL PAYMENT DEDUCTIONS = $ 530.32

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #5
PREVENTIVE MAINTENANCE INSPECTION AND SERVICE

1. Contract Requirement. Preventive Maintenance Inspection And Service

Work Requirements	Standards of Performance
a. Timely Completion	Work completed by date specified in approved PM schedule (Paragraph C.12.a)
b. PM Equipment Cards and Tags	Cards and tags initialed and dated after completion of PM (Paragraph C.12.d)
c. Quality Work	All check points completed, equipment deficiencies corrected in conformance with quality standards, Section C
d. Weekly PM Completion Report	All required information provided, submitted by !INSERT TIME! each Monday (Paragraph C.12.b)

2. Primary Method of Surveillance. 100% Inspection for work requirement a, planned sampling supported by unscheduled inspections for work requirements b, c, and d.

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	5%
b. PM Equipment Cards and Tags	5%
c. Quality Work	5%
d. Weekly PM Completion Report	5%

4. Quantity of Work. The quantity of work per month will equal the number of PM inspections scheduled by the Contractor.

5. Level of Surveillance. Not applicable for work requirement a. For all other work requirements, the normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect rate (ODR) for quality of work exceeds the MADR during any given month. If only the ODR for completion report or cards and tags exceeds the MADR, consider increasing the level of surveillance for those work requirements only. Go to reduced surveillance if the ODR for quality of work is less than one half the MADR for two consecutive months.

6. Sample Size. Not applicable for work requirement a. For all other work requirements, the following sample sizes are established for each level of surveillance:

Reduced - 5% of the PMs completed
Normal - 10% of the PMs completed
Increased - 20% of the PMs completed

7. Sampling Procedures. Not applicable for work requirement a. For all other work requirements, the QAE will choose every tenth PM (if at normal surveillance) from the schedule of completed PMs (including those PMs completed that were deferred from previous weeks) that is submitted by the Contractor each

Monday. Choose every fifth PM if at increased surveillance, and every twentieth PM if at reduced surveillance.

8. Evaluation Procedures. In recording the results of inspections, note that separate EVALUATION WORK SHEETs will be filled out for each different type of PM service performed during the month. For example, if monthly, quarterly, and semiannual air handler PM services are to be performed during the month, three EVALUATION WORK SHEETs will be required.

a. Timely Completion. The QAE will review the Contractor's PM completion report each Monday and list on an EVALUATION WORK SHEET each of the scheduled PM inspections reported by the Contractor as being incomplete. All four of the work requirements for these PMs will be marked as unsatisfactory (U). At this time also review those PM inspections not completed during previous weekly reports which the Contractor has now listed as complete, and fill out the rework portion of the appropriate EVALUATION WORK SHEET(s).

b. Other Work Requirements. As soon as possible after the sampled PMs have been selected the QAE will make an on-site visit and evaluate the quality of work, PM cards and tags, and work completion report work requirements as either satisfactory (S) or unsatisfactory (U) an EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information, if appropriate, will be recorded. In some instances where the work is hard to inspect after the fact, or the system being PM'd is critical, inspections should be made while the PM work is in progress. In most all instances when the quality of work is considered unsatisfactory, the timeliness and cards and tags work requirements will also be considered unsatisfactory.

c. Unscheduled Inspections. Unscheduled inspections may be conducted on any PM inspection, but should be limited to those of particular importance, such as semi-annual or annual PMs on large or critical systems, PMs in buildings where HVAC problems have been noted previously, etc. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

d. Rework. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. Therefore, each inspection marked for rework must be reinspected by the QAE to see if the work was satisfactorily completed, and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate ODRs and recommended payment deductions for each work requirement.

a. Payment deductions will be calculated on a MONTHLY PAYMENT ANALYSIS FORM. A separate form will be filled out for each different type of PM performed during the month, since there are separate prices for each service in the Schedule of Deductions. For example, if the Contractor performed monthly, quarterly, and semiannual air handler PM services during the month, three MONTHLY PAYMENT ANALYSIS FORMs will be filled out. An example MONTHLY PAYMENT ANALYSIS FORM for quarterly PM of air handlers is attached.

b. ODRs will be calculated for each work requirement for the overall performance of PM inspection and service by combining the inspection results from all PM MONTHLY PAYMENT ANALYSIS FORMs and using the following formula:

$$\text{ODR} = \frac{\text{Total Number of Defects Observed in Sample}}{\text{Number of PMs Sampled}}$$

(1) If the ODR for a work requirement is less than the MADR, the Contractor’s overall performance of that requirement is satisfactory for the month. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work. Consider whether or not minimum surveillance should be used for the coming evaluation period.

(2) If the ODR for a work requirement is greater than the MADR, the Contractor's overall performance of that requirement is unsatisfactory, and the QAE should recommend to the FSCM that a CDR be issued to the Contractor or that stronger action be taken. Increased surveillance should be used for the coming evaluation period (see paragraph 5 above).

EVALUATION WORK SHEET
PREVENTIVE MAINTENANCE INSPECTION AND SERVICE
QA PLAN #5

TYPE OF PM: AIR HANDLERS - QUARTERLY

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS				REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
	TIMELY COMPLETION	EQUIPMENT CARDS/TAGS	QUALITY WORK	WEEKLY PM COMPLETION REPORT			

CONTRACTOR'S SIGNATURE/DATE

QAE'S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
PREVENTIVE MAINTENANCE INSPECTION AND SERVICE

TYPE OF PM: Air Handler - Quarterly

Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	EQUIPMENT CARDS/TAGS	QUALITY WORK	WEEKLY PM COMPLETION REPORT
a. Relative value of services (from PRS table)	15%	10%	60%	15%
b. Price per service (from Schedule of Deductions, Item 10)	$ 4.13	$ 2.75	$ 16.50	$ 4.13
c. Population	400	400	400	400
d. Price of contract requirement (b x c)	$1,652.00	$1,100.00	$6,600.00	$1,652.00
e. Number of services sampled (Normal)	40	40	40	40
f. Number in sample defective	7	8	5	7
g. Defects observed outside sample	3	2	2	3
h. Total observed defects (f + g)	10	10	7	10
i. Number of services reworked by Contractor	0	2	1	0
j. Number of services reworked by Government or others	0	0	0	0
k. Net services deducted at schedule price (h - i - j)	10	8	6	10
l. Net amount to deduct (b x k)	$ 41.30	$ 22.00	$ 99.00	$ 41.30
m. Deduct Government rework actual cost or at schedule price (b x j)	$ 0	$ 0	$ 0	$ 0
n. LDs on Government rework (20% x m)	$ 0	$ 0	$ 0	$ 0
o. LDs on all other defects [10% x b x (h - j)]	$ 4.13	$ 2.75	$ 11.55	$ 4.13
p. Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0	0
q. Total deductions (l + m + n + o + p)	$ 45.43	$ 24.75	$ 110.55	$ 45.43

TOTAL PAYMENT DEDUCTIONS = $ 226.16

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #6
EQUIPMENT OPERATIONS

1. Contract Requirement. Equipment Operations

Work Requirements	Standards of Performance
a. Quality Work	Equipment operated in conformance with manufacturer's recommendations (Clause C.13)
b. Operation Log Sheets	Maintained as specified, submitted with monthly invoice (Paragraph C.13.b)

2. Primary Method of Surveillance. Planned sampling supported by unscheduled inspections.

3. Maximum Allowable Defect Rate (MADR)

a. Quality Work	5%
b. Operation Log Sheets	5%

4. Quantity of Work. The number of systems which require operation, as listed in Attachment J-C1, times the number of days in the evaluation period.

5. Level of Surveillance. The normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect rate (ODR) for quality of work exceeds the MADR during any given month. Go to reduced surveillance if the ODR for quality of work is less than one half the MADR for two consecutive months.

6. Sample Size

Reduced - all systems inspected monthly
Normal - all systems inspected semimonthly
Increased - all systems inspected weekly

7. Sampling Procedures. Since systems must be operated correctly, all systems may be considered ready for inspection at any time. Prior to the start of the month, the QAE will arbitrarily select and record on the inspection schedule the date of inspection for each system.

8. Evaluation Procedures. The QAE will visit the site of the systems to be inspected and evaluate both of the work requirements as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. Quality work will be evaluated as unsatisfactory if equipment gauges or other operating standards are reading outside of the recommended ranges. The operation log sheet work requirement will be evaluated unsatisfactory if the last entry is not current, or if there are significant notable errors in previous entries. Notify the Contractor immediately of any unsatisfactory grades and continue to monitor the Contractor's corrective actions until the results are satisfactory. An unsatisfactory quality work grade will be recorded as an unscheduled inspection on the EVALUATION WORK SHEET for each calendar day that readings are not within recommended operating ranges. Additional unscheduled inspections may be conducted on any system, but should be limited to those of particular importance, such as those where performance problems have been noted in the

past. Unscheduled inspections may also be conducted if an unsatisfactory trend develops during the month. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate ODRs and recommended payment deductions for both work requirements on a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work, and should consider whether or not reduced surveillance should be used for the coming evaluation period. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
EQUIPMENT OPERATIONS
QA PLAN #6

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS		DATE OUT OF COMPLIANCE	DATE IN COMPLIANCE	REMARKS
	QUALITY WORK	OPERATION LOG SHEETS			

CONTRACTOR'S SIGNATURE/DATE

QAE'S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
EQUIPMENT OPERATIONS

	Analysis for period 1 Aug 91 - 31 Aug 91	QUALITY WORK	OPERATION LOG SHEETS
a.	Relative value of services (from PRS table)	80%	20%
b.	Price for contract requirement from Schedule of Deductions, Item 12)	$ 2,400.64	$ 600.16
c.	Population (number of days in month x number of systems)	310	310
d.	Price per day (b ÷ c)	$ 7.74	$ 1.93
e.	Number of services sampled (Normal)	20	20
f.	Number in sample defective	2	1
g.	Defects observed outside sample	6	8
h.	Total observed defects (f + g)	8	9
i.	Observed Defect Rate (f ÷ e)	10.0%	5.0%
j.	Number of services reworked by Contractor	N/A	N/A
k.	Number of services reworked by Government or others	N/A	N/A
l.	Net services deducted at schedule price (h - j - k)	8	9
m.	Net amount to deduct (d x l)	$ 61.92	$ 17.37
n.	Deduct Government rework actual cost or at scheduled price (d x k)	$ 0	$ 0
o.	LDs Government rework (20% x n)	$ 0	$ 0
p.	LDs on all other defects [10% x d x (h - k)]	$ 6.19	$ 1.73
q.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0
r.	Total deductions (m + n + o + p + q)	$ 68.11	$ 19.10

TOTAL PAYMENT DEDUCTIONS = $ 87.21

_____
AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #7
START-UP/SHUT-DOWN SERVICES

1. Contract Requirement. Start-up/Shut-down Services

Work Requirements	Standards of Performance
a. Timely Completion	Work completed within !INSERT! calendar days of specified start date [Paragraph C.14.a(1)]
b. Quality Work	Specific checks, procedures, and operational checks performed, equipment deficiencies corrected in accordance with quality standards, Section C [Paragraph C.14.a(2)]
c. Work Completion Report	Submitted within !INSERT! working days after completion of start-up/shut-down, needed repairs identified [Paragraph C.14.a(2)]

2. Primary Method of Surveillance. 100% Inspection p

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	5%
b. Quality Work	5%
c. Work Completion Report	5%

4. Quantity of Work. The number of systems requiring start-up or shut-down services during the monthly evaluation period.

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedures. As soon as possible after completion of each start-up/shut-down service, the QAE will make an on-site visit and evaluate the timely completion and work quality work requirements as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. The deficiencies listed on the work completion report will be checked against those found during the on-site inspection. If there is disagreement, this work requirement will be evaluated as unsatisfactory (U) on the EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information will be recorded, if appropriate. In most all instances when the quality of work is considered unsatisfactory, timely completion will also be considered unsatisfactory. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. Therefore, each service marked for rework must be reinspected by the QAE to see if the work was satisfactorily completed, and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate observed defect rates (ODRs) and recommended payment deductions for each work requirement a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. Payment deductions will be made for all documented defects as calculated on the MONTHLY PAYMENT ANALYSIS FORM. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work.

b. If the ODR is greater than the MADR, overall performance of that work requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
START-UP/SHUT-DOWN SERVICES
QA PLAN #7

DATE/TIME	BUILDING NUMBER/ SYSTEM	START-UP/ SHUT-DOWN	WORK REQUIREMENTS			REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
			TIMELY COMPLETION	QUALITY WORK	WORK COMPLETION REPORT			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
START-UP/SHUT-DOWN SERVICES

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	QUALITY WORK	PROPER PROCEDURES
a.	Relative value of services (from PRS table)	20%	70%	10%
b.	Price per service (from Schedule of Deductions Item 13)	$ 15.90	$ 55.65	$ 7.95
c.	Population	45	45	45
d.	Total price of services (b x c)	$ 715.50	$2,504.25	$ 357.75
e.	Number of defects	5	5	6
f.	Observed Defect Rate (e ÷ c)	11.1%	11.1%	13.3%
g.	Number of services reworked by Contractor	0	0	0
h.	Number of services reworked by Government or others	0	0	0
i.	Net services deducted at schedule price (e - g - h)	5	5	6
j.	Net amount to deduct (b x i)	$ 79.50	$ 278.25	$ 47.70
k.	Deduct Government rework actual cost or at schedule price (b x h)	0	0	0
l.	LDs on Government rework (20% x k)	$ 0	$ 0	$ 0
m.	LDs on all other defects [10% x b x (e - h)]	$ 7.95	$ 27.82	$ 4.77
n.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0
o.	Total deductions (j + k + l + m + n)	$ 87.45	$ 306.07	$ 52.47

TOTAL PAYMENT DEDUCTIONS = $ 445.99

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #8
FILTER MAINTENANCE SERVICES

1. Contract Requirement. Provide Air Filter Maintenance Services

Work Requirements	Standards of Performance
a. Timely Completion	Filter changed or cleaned when scheduled (Attachment J-C14)
b. Quality Work	Filters changed or properly cleaned (Paragraph C.14.h)

2. Primary Method of Surveillance. Planned sampling supported by unscheduled inspections.

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	5%
b. Quality Work	5%

4. Quantity of Work. The quantity of work per month will equal the number of filters scheduled to be maintained by the Contractor.

5. Level of Surveillance. The normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect (ODR) for quality of work exceeds the MADR during any given month. If only the ODR for completion, exceeds the MADR, consider increasing the level of surveillance for that work requirement only. Go to reduced surveillance if the ODR for quality of work is less than one half the MADR for two consecutive months.

6. Sample Size

Reduced - 10% of the systems scheduled for filter maintenance
Normal - 25% of the systems scheduled for filter maintenance
Increased - 50% of the systems scheduled for filter maintenance

7. Sampling Procedures. The QAE will choose every fourth system (if at normal surveillance) from the Contractor’s filter maintenance schedule. Choose every tenth system if at reduced surveillance, and every other system if at increased surveillance.

8. Evaluation Procedure. The QAE will inspect all the filters on the selected equipment units soon after they are scheduled to be cleaned or changed, and evaluate the work requirements listed in paragraph 1 as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. A brief but complete description of any noted defects, including reason for each defect and number of filters not changed/cleaned, will be provided and rework information will be recorded, if appropriate.

a. Unscheduled Inspections. Unscheduled inspections may be conducted on any filter service, but should be limited to those of particular importance, such as systems where performance problems have been noted in the past. Unscheduled inspections may also be conducted if an unsatisfactory trend

develops during the month. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

b. Rework. Rework will normally be allowed when practical, and must be completed by the Contractor within 24 hours of notification. All work marked for correction will be reinspected by the QAE as soon as possible after the 24 hour notification and appropriate notations completed on the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections, calculate ODRs and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM, and determine if any change in the level of surveillance is needed for the coming evaluation period (see paragraph 5 above). An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is greater than its MADR, overall performance of that requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance of that requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
FILTER MAINTENANCE SERVICES
QA PLAN #8

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS		REWORK ORDERED DATE/TIME	REWORK ORDERED DATE/TIME	REMARKS
	TIMELY COMPLETION	QUALITY WORK			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
FILTER MAINTENANCE SERVICES

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	QULAITY QUALITY WORK
a.	Relative value of services (from PRS table)	20%	80%
b.	Price per service (from Schedule of Deductions, Item 14)	$ 120.00	$ 480.00
c.	Population (total number of filters scheduled)	300	300
d.	Price per service (b ÷ c)	$ 0.40	$ 1.60
e.	Number of filters inspected	75	75
f.	Number in sample defective	8	2
g.	Defects observed outside sample	3	2
h.	Total observed defects (f + g)	11	4
i.	Observed Defect Rate (f ÷ e)	10.6%	2.6%
j.	Number of services reworked by Contractor	0	0
k.	Number of services reworked by Government or others	0	0
l.	Net services deducted at schedule price (h - j - k)	11	4
m.	Net amount to deduct (d x l)	$ 4.40	$ 6.40
n.	Deduct Government rework actual cost or at schedule price (d x k)	$ 0	$ 0
o.	LDs on Government rework (20% x n)	$ 0	$ 0
p.	LDs on all other defects [10% x d x (h - k)]	$ 0.44	$ 0.64
q.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0
r.	Total deductions (m + n + o + p + q)	$ 4.84	$ 7.04

TOTAL PAYMENT DEDUCTIONS = $ 11.88

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #9
CHEMICAL TREATMENT OF COOLING TOWER WATER

1. Contract Requirement. Maintain Chemistry of Cooling Tower Water

Work Requirements	Standards of Performance
a. pH Level	Within the limits specified in the treatment program (Paragraph C.15.a)
b. Conductivity	Within the limits specified in the treatment program (Paragraph C.15.a)
c. Corrosion and Scale Inhibitor	Within the limits specified in the treatment program (Paragraph C.15.a)
d. Biocide Level	Within the limits specified in the treatment program (Paragraph C.15.a)

2. Primary Method of Surveillance. Planned sampling supported by unscheduled inspections.

3. Maximum Allowable Defect Rate (MADR)

a. pH Level	5%
b. Conductivity	5%
c. Corrosion/Scale Inhibitor	5%
d. Biocide Level	5%

4. Quantity of Work. The number of cooling towers which require chemical treatment, as listed in J-C15, times the number of days in the evaluation period.

5. Level of Surveillance. The normal level of surveillance will be used initially for the contract. Go to increased surveillance if the observed defect rate (ODR) for any one of the given work requirements exceeds the MADR during any given month. Go to reduced surveillance if the ODR for all work requirements are less than one half the MADR for two consecutive months.

6. Sample Size

Reduced - All cooling towers inspected monthly
Normal - All cooling towers inspected semimonthly
Increased - All cooling towers inspected weekly

7. Sampling Procedures. Since water chemistry must be maintained within specified limits at all times, all towers may be considered ready for inspection at any time. Prior to the start of each month, the QAE will arbitrarily select and record on the inspection schedule the date of inspection for each tower.

8. Evaluation Procedures. The QAE will independently test the water chemistry for each cooling tower on the day of the scheduled inspection, record test results, and evaluate each of the work requirements listed in paragraph 1 as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. Notify the Contractor immediately of any unsatisfactory grades and continue to monitor the Contractor’s corrective actions and the level of

chemical concentrations until all test results are satisfactory. An unsatisfactory grade will be recorded as an unscheduled inspection on the EVALUATION WORK SHEET for each calendar day that each chemical level is not in compliance with the specified limits. Additional unscheduled inspections may be conducted on any cooling tower, but should be limited to those of particular importance, such as those where performance problems have been noted in the past. Unscheduled inspections may also be conducted if an unsatisfactory trend develops during the month. Unscheduled inspections should be documented on a separate EVALUATION WORK SHEET from that used for planned sampling.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate ODRs and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work, and should consider whether or not reduced surveillance should be used for the coming evaluation period. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance of that requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Consider whether or not increased surveillance should be used for the coming evaluation period. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
CHEMICAL TREATMENT OF COOLING TOWER WATER
QA PLAN #9

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS								DATE OUT OF COMPLIANCE	DATE IN COMPLIANCE	REMARKS
	pH LEVEL		CONDUCTIVITY		CORROSION/SCALE INHIBITOR		BIOCIDE LEVEL				
	READING	S/U	READING	S/U	READING	S/U	READING	S/U			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
CHEMICAL TREATMENT OF COOLING TOWER WATER

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY RESPONSE	TIMELY COMPLETE	CORROSION/ SCALE INHIBITOR LEVEL	BIOCIDE LEVEL
a.	Relative value of services (from PRS table)	25%	25%	25%	25%
b.	Price per contract requirement (from Schedule of Deductions, Item 15)	$ 554.28	$ 554.28	$ 554.28	$554.28
c.	Population (number of days in month x number systems)	930	930	930	930
d.	Price per day (b ÷ c)	$ 0.596	$ 0.596	$ 0.596	$ 0.596
e.	Number of services sampled (Normal)	60	60	60	60
f.	Number in sample defective	6	8	16	5
g.	Defects observed outside sample	87	23	108	73
h.	Total observed defects (f + g)	93	31	124	78
i.	Observed Defect Rate (f ÷ e)	10.0%	13.3%	26.6%	8.3%
j.	Number of services reworked by Contractor	N/A	N/A	N/A	N/A
k.	Number of services reworked by Government or others	N/A	N/A	N/A	N/A
l.	Net services deducted at schedule price (h - j - k)	93	31	124	78
m.	Net amount to deduct (d x l)	$ 55.42	$ 18.47	$ 73.90	$ 46.48
n.	Deduct Government rework actual cost or schedule price (d x k)	$ 0	$ 0	$ 0	$ 0
o.	LDs Government rework (20% x n)	0	0	0	0
p.	LDs on all other defects [10% x d x (h - k)]	$ 5.54	$ 1.84	$ 7.39	$ 4.64
q.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0	$ 0	$ 0
r.	Total deductions (m + n + o + p + q)	$ 60.96	$ 20.31	$ 81.29	$ 51.12

TOTAL PAYMENT DEDUCTIONS = $213.68

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #10
CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS

1. Contract Requirement. Maintain chemistry of chilled water

Work Requirements	Standards of Performance
a. Timely Completion	Make checks/tests as scheduled (Clause C.16)
b. Quality Work	Check pH and corrosion inhibitor levels, make treatment program changes, if required (Clause C.16)

2. Primary Method of Surveillance. One hundred percent inspection

3. Maximum Allowable Defect Rate (MADR). 5% for both work requirements.

a. Timely Completion	5%
b. Quality Work	5%

4. Quantity of Work. There are !INSERT NUMBER! chilled water systems which require chemical treatment of chilled water once per quarter. The actual quantity of work per month will equal the number of inspection checks scheduled by the Contractor.

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedures. The QAE will inspect every chilled water system being treated once per quarter within two working days after the ACO receives the Contractor's inspection report. A water sample shall be drawn from each system and tested for pH and corrosion inhibitor levels. Tests results will then be compared to the allowable limits specified in clause C.16 and those shown in the inspection reports for each system. Record test results and either satisfactory (S) or unsatisfactory (U) grades for both work requirements on the attached EVALUATION WORK SHEET. A brief description of any noted defects will be provided and rework information will be recorded, if appropriate. In most all instances where the quality of work is considered unsatisfactory, timeliness will also be considered unsatisfactory. Provide copies of all negative inspection reports to the Contractor.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate observed defect rates (ODRs) and recommended payment deductions for each work requirement on a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

b. If the ODR for a work requirement is greater than the MADR, overall performance of that requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS
QA PLAN #10

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS				REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
	TIMELY COMPLETION		QUALITY WORK				
	READING	S/U	READING	S/U			

CONTRACTOR’S SIGNATURE/DATE

QAE’S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	QUALITY WORK
a.	Relative value of services (from PRS table)	10%	90%
b.	Price per contract requirement (from Schedule of Deductions, Item 16)	$ 10.00	$ 90.00
c.	Population	10	10
d.	Total price of service (b x c)	$ 100.00	$ 900.00
e.	Number of defects	2	1
f.	Observed defect rate (e ÷ c)	20%	10%
g.	Number of services reworked by Contractor	0	1
h.	Number of services reworked by Government or others	0	0
i.	Net services deducted at schedule price (e - g - h)	2	0
j.	Net amount to deduct (b x i)	$ 20.00	$ 0
k.	Deduct for Government rework actual cost or at schedule price (b x h)	$ 0	$ 0
l.	LDs Government rework (20% x k)	$ 0	$ 0
m.	LDs on all other defects [10% x b x (e - h)]	$ 2.00	$ 9.00
n.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0
o.	Total deductions (j + k + l + m + n)	$ 22.00	$ 9.00

TOTAL PAYMENT DEDUCTIONS = $ 31.00

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #11
CERTIFICATION OF UNFIRED PRESSURE VESSELS

1. Contract Requirement. Certification of Unfired Pressure Vessels

Work Requirements	Standards of Performance
a. Timely Completion	Vessels prepared for inspection by the date specified by the ACO (Paragraph C.17.b)
b. Quality Work	Vessels prepared for inspection in accordance with applicable references (Paragraph C.17.b)

2. Primary Method of Surveillance. One hundred percent inspection

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	5%
b. Quality Work	5%

4. Quantity of Work. The number of unfired pressure vessels that require certification during the monthly evaluation period.

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedure. The QAE will visit each unfired pressure vessel certification site while work is in progress and grade the timely completion and work quality work requirements as either satisfactory (S) or unsatisfactory (U) on the attached EVALUATION WORK SHEET. These grades will be established only after consulting with the certified inspector to determine if the system was properly prepared for inspection. In almost all instances where the quality of work is considered unsatisfactory, the timeliness work requirement will also be considered unsatisfactory. Provide copies of all negative inspection reports to the Contractor.

9. Analysis of Results. At the end of the month the QAE will summarize the results of the month's inspections and calculate observed defect rates (ODRs) and recommended payment deductions for both work requirements on a MONTHLY PAYMENT ANALYSIS FORM. An example MONTHLY PAYMENT ANALYSIS FORM is attached.

a. If the ODR for a work requirement is less than its MADR, overall performance of that requirement is satisfactory. Payment deductions will be made for all documented defects, as calculated on the MONTHLY PAYMENT ANALYSIS FORM. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work.

b. If the ODR is greater than the MADR, overall performance of that work requirement is unsatisfactory and the QAE should recommend to the FSCM that CDR

be issued to the Contractor, or that stronger action be taken. Payment deductions will be made as calculated on the MONTHLY PAYMENT ANALYSIS FORM.

EVALUATION WORK SHEET
CERTIFICATION OF UNFIRED PRESSURE VESSELS
QA PLAN #11

BUILDING NUMBER/ SYSTEM	WORK REQUIREMENTS		REWORK ORDERED DATE/TIME	REWORK ORDERED DATE/TIME	REMARKS
	TIMELY COMPLETION	QUALITY WORK			

CONTRACTOR'S SIGNATURE/DATE

QAE'S SIGNATURE/DATE

MONTHLY PAYMENT ANALYSIS FORM
CERTIFICATION OF UNFIRED PRESSURE VESSELS

	Analysis for period 1 Aug 91 - 31 Aug 91	TIMELY COMPLETION	QUALITY WORK
a.	Relative value of services (from PRS table)	25%	75%
b.	Price per service (from Schedule of Deductions, Item 17)	$ 17.89	$ 53.66
c.	Population	15	15
d.	Total price of service (b x c)	$ 268.35	$ 804.90
e.	Number of defects	2	2
f.	Observed Defect Rate (e ÷ c)	13.3%	13.3%
g.	Number of services reworked by Contractor	0	1
h.	Number of services reworked by Government or others	0	0
i.	Net services to deduct at schedule price (e - g - h)	2	1
j.	Net amount to deduct (b x i)	$ 35.78	$ 53.66
k.	Deduct Government rework actual cost or at schedule price (b x h)	$ 0	$ 0
l.	LDs on Government rework (20% x k)	$ 0	$ 0
m.	LDs on all other defects [10% x b x (e - h)]	$ 3.57	$ 10.73
n.	Other adjustments ("-" indicates a deduction)	$ 0	$ 0
o.	Total deductions (j + k + l + m + n)	$ 39.35	$ 64.39

TOTAL PAYMENT DEDUCTIONS = $ 103.74

AUTHORIZED SIGNATURE/DATE

QUALITY ASSURANCE PLAN #12
MINOR WORK

1. Contract Requirement. Perform Minor Work

Work Requirements	Standards of Performance
a. Timely Completion	Urgent minor work completed within !INSERT! days. Routine minor work completed within !INSERT! days (Paragraph C.11.d)
b. Quality Work	Work performed in accordance with quality standards, Section C

2. Primary Method of Surveillance. 100% inspection.

3. Maximum Allowable Defect Rate (MADR)

a. Timely Completion	3%
b. Quality Work	3%

4. Quantity of Work. The total number of delivery orders issued during each monthly evaluation period. The following is a historical average.

JAN 10	APR 29	JUL 29	OCT 22
FEB 9	MAY 27	AUG 26	NOV 13
MAR 21	JUN 29	SEP 24	DEC 11

5. Level of Surveillance. Not applicable

6. Sample Size. Not applicable

7. Sampling Procedures. Not applicable

8. Evaluation Procedures. The QAE will evaluate the Contractor's performance at least once for each delivery order issued. A number of inspections may be required while work is in progress to adequately evaluate some delivery orders, especially those with multiple work items and key work phases. A final inspection will be made as soon as possible after notification by the Contractor that work on a delivery order is complete, and not later than the work day following scheduled work completion. The quality of work will be evaluated at each inspection, and a brief but complete description of any noted defects will be recorded on the attached EVALUATION WORK SHEET. A separate EVALUATION WORK SHEET will be filled out for each delivery order. At the final inspection, final grades will be assigned to both work requirements for the Contractors overall performance of the work in the delivery order.

a. Rework will normally be required. Record all appropriate rework information on the EVALUATION WORK SHEET.

b. When determining the overall quality of work grade to be assigned for each delivery order, the QAE must carefully consider the total scope of work required and subjectively judge whether it has been substantially

completed by the Contractor without an inordinate amount of rework being required. Generally, the QAE should grade a delivery order satisfactory overall if there has been no willful departure from the contract, there is no omission of essential work, and essentially 95% or more of the total work has been completed without rework being required. If overall work quality for a delivery order is considered unsatisfactory, timeliness must also be considered unsatisfactory. The QAE should discuss questionable grades with the FSCM prior to providing the Contractor with a copy of the EVALUATION WORK SHEET.

9. Analysis of Results. At the end of the month, the QAE will summarize the number of unsatisfactory overall grades for timeliness and quality of work, and calculate observed defect rates (ODRs) for each using the following formula.

$$ODR = \frac{\text{Number of overall unsatisfactory grades}}{\text{Total number of work authorizations inspected}} \times 100$$

For example:

Number of overall unsatisfactory quality grades = 2
Number of delivery orders inspected = 23

ODR for quality work = 2 ÷ 23 x 100 = 8.7%

a. If the ODR for a work requirement is equal to or less than its MADR, overall performance of that indicator is satisfactory for the month. If the ODR is less than ½ of the MADR, the QAE should recommend to the FSCM to notify the Contractor that performance is excellent and to keep up the good work.

b. If the ODR is greater than the MADR, overall performance of that work requirement is unsatisfactory and the QAE should recommend to the FSCM that a CDR be issued to the Contractor, or that stronger action be taken.

c. Payment deductions, if any, will be subtracted from each indefinite quantity work authorization invoiced by the Contractor.

EVALUATION WORK SHEET
MINOR WORK
QA PLAN #12

CONTRACT NO._____ DELIVERY ORDER NO._____

JOB TITLE_____ BLDG NUMBER/SYSTEM_____

DATE/TIME	WORK REQUIREMENTS		REWORK ORDERED DATE/TIME	REWORK COMPLETED DATE/TIME	REMARKS
	TIMELINESS S/U	QUALITY WORK S/U			

OVERALL GRADE: _____ _____

_____ _____

CONTRACTOR'S SIGNATURE/DATE QAE'S SIGNATURE/DATE

IV. CONTRACTOR'S OVERALL PERFORMANCE EVALUATION. NAVFAC MO-327 and the NAVFAC RSED (V3.2) implementation guide provide guidance in determining the Contractor's overall monthly performance for each service; how to use the PRS table and the QAE's inspection results to calculate the total payment due for each service; and how to go about correcting problem areas of performance. This paragraph provides additional information on the completion of the MONTHLY PAYMENT ANALYSIS FORMs included in the sample QA plans, and includes a sample monthly summary report.

A. Monthly Payment Analysis Form. These forms are very useful for summarizing the results of each month's inspections and illustrate how the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES" and "ESTIMATING THE PRICE OF NONPERFORMED OR UNSATISFACTORY WORK" clauses, the Schedule of Deductions, the PRS table, and the QAE's completed EVALUATION WORK SHEETS are all used in calculating the total payment due for each contract requirement. The format for these forms should be tailored by the user. Other sample formats may be found in the NAVFAC MO-327, the NAVFAC RSED implementation guide, and as mentioned previously, computer programs are available which will perform and document basically the same calculations.

B. Analysis of Results. The end result of the monthly inspection process is the overall evaluation of the Contractor's performance for each HVAC operation and maintenance service inspected. Such an evaluation provides a summary of the Contractor's performance to the ACO, FSCM, QAE, customer representatives, and the Contractor. Overall performance is important in determining whether to increase, decrease, or maintain surveillance at the same level; whether to issue one or more CDRs to the Contractor or take stronger administrative actions; and points out service areas which require greater QAE and Contractor QC emphasis during the next evaluation period. Therefore, at the end of each month the QAE should complete and forward for the FSCM's approval a MONTHLY SUMMARY REPORT, in a format similar to that shown in Table 1 on the next page. Almost all of the information required to complete this summary can be taken directly from the MONTHLY PAYMENT ANALYSIS FORM included with the sample QA plans.

C. Contract Discrepancy Report (CDR). When the Contractor's overall performance for any given work requirement is unsatisfactory, the QAE will recommend to the FSCM that a CDR be issued. Instructions on the use of CDRs, along with a typical format, are included in Chapter 6 of NAVFAC MO-327.

D. Recommended Deductions. The QAE will recommend to the FSCM those payment deductions that should be made. All work documented as not in compliance with the contract requirements (nonperformed or unsatisfactorily performed) is subject to payment deductions plus a 10% or 20% administrative cost (liquidated damages) in accordance with the provisions of the "CONSEQUENCES OF CONTRACTOR'S FAILURE TO PERFORM REQUIRED SERVICES", Section E. Since Government forces are normally not available to reperform work, the Government will usually either require the Contractor to reperform the work or let it go until the next scheduled occurrence. Therefore, the 10% factor would be used.

TABLE 1

MONTHLY PERFORMANCE EVALUATION REPORT
HVAC OPERATION AND MAINTENANCE
MONTH OF AUGUST, 1991

CONTRACT NUMBER:_____ CONTRACTOR:_____

	MADR	PREVIOUS ODR	CURRENT ODR	#VCC*	CDR	DEDUCTIONS
QA PLAN #1						
RECORDS AND REPORTS						
Timely Submission/Filing	5%	2.9%	6.7%	N/A	Y	$ 45.63
Quality Work	5%	10.3%	7.5%	N/A	Y	$ 58.67
QA PLAN #2						
EMERGENCY SERVICE CALLS						
Timely Response	3%	2.7%	8.8%	N/A	Y	$ 112.82
Timely Completion	3%	4.8%	5.9%	N/A	Y	$ 21.36
Quality Work	3%	5.6%	0.0%	N/A	N	$ 0
Proper Procedures	3%	4.2%	2.9%	N/A	N	$ 10.68
QA PLAN #3						
URGENT SERVICE CALLS						
Timely Response	5%	1.7%	22.7%	3	Y	$ 158.40
Timely Completion	5%	2.8%	13.6%	0	Y	$ 29.70
Quality Work	5%	4.3	9.0%	1	Y	$ 178.20
Proper Procedures	5%	10.2%	4.5%	0	N	$ 9.90
QA PLAN #4						
ROUTINE SERVICE CALLS						
Timely Completion	5%	3.5%	11.4%	2	Y	$ 96.22
Quality Work	5%	4.3%	8.5%	2	Y	$ 401.06
Proper Procedures	5%	10.2%	8.5%	1	Y	$ 33.04
QA PLAN #5						
PM INSPECTION AND SERVICE						
Timely Completion	5%	11.3%	5.8%	N/A	Y	$ 522.70
Equipment Cards and Tags	5%	20.3%	10.1%	N/A	Y	$ 461.65
Quality Work	5%	15.2%	8.5%	N/A	Y	$ 1,755.94
PM Completion Report	5%	13.1%	6.3%	N/A	Y	$ 469.66
QA PLAN #6						
EQUIPMENT OPERATIONS						
Quality Work	5%	7.1%	10.0%	N/A	Y	$ 68.11
Operation Log Sheets	5%	8.7%	5.0%	N/A	N	$ 19.10
QA PLAN #7						
START-UP/SHUT-DOWN SERVICES						
Timely Completion	5%	3.7%	11.1%	N/A	Y	$ 87.45
Quality Work	5%	8.2%	11.1%	N/A	Y	$ 306.07
Work Completion Report	5%	7.3%	13.3%	N/A	Y	$ 52.47
QA PLAN #8						
FILTER MAINTENANCE						
Timely Completion	5%	3.3%	10.0%	N/A	Y	$ 4.84
Quality Work	5%	4.3%	2.6%	N/A	N	$ 7.04

CONTRACT NUMBER:_____ CONTRACTOR:_____

	MADR	PREVIOUS ODR	CURRENT ODR	#VCC*	CDR	DEDUCTIONS
QA PLAN #9						
CHEMICAL TREATMENT OF COOLING TOWER						
pH Level	5%	4.7%	10.0%	N/A	Y	$ 60.96
Conductivity	5%	15.5%	13.3%	N/A	Y	$ 20.31
Corrosion/Scale Inhibitor Level	5%	2.7%	26.6%	N/A	Y	$ 81.29
Biocide Level	5%	3.9%	8.3%	N/A	Y	$ 51.12
QA PLAN #10						
CHEMICAL TREATMENT OF CHILLED WATER SYSTEMS						
Timely Completion	5%	20.0%	20.0%	N/A	Y	$ 22.00
Quality Work	5%	10.0%	20.0%	N/A	Y	$ 9.00
QA PLAN #11						
CERTIFICATION OF UNFIRED PRESSURE VESSELS						
Timely Completion	5%	10.5%	13.3%	N/A	Y	$ 39.35
Quality Work	5%	4.7%	13.3%	N/A	Y	$ 64.39
QA PLAN #12						
MINOR WORK						
Timely Completion	3%	5.4%	2.1%	N/A	N	$ 457.32
Quality Work	3%	7.5%	5.8%	N/A	Y	$ 871.47

CONTRACTOR'S INVOICE AMOUNT $ 238,811.91

TOTAL DEDUCTIONS $ 6,638.64

RECOMMENDED PAYMENT $ 232,173.27

CONTRACTOR'S OVERALL PERFORMANCE FOR THE MONTH:

SATISFACTORY _____ UNSATISFACTORY _____

_____

QAE'S SIGNATURE/DATE

* Number of validated customer complaints

END OF QA GUIDE